

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA

MEMC ELECTRONIC MATERIALS, INC.,

No. C 01-4925 SBA

(Related to Case No. C 05-2133 SBA)

Plaintiff,

v.

ORDER

MITSUBISHI MATERIALS SILICON
CORPORATION, et al.,

[Docket No. 499, 505, 544, 572, 577, 667]

Defendants.

This matter comes before the Court on Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity of US Patent No. 5,919,302 [Docket No. 505]; Defendants' Motion for Summary Judgment of Zero Damages Because of No Inducement under 35 U.S.C. § 271(b) [Docket No. 499]; Plaintiff's Motion for Summary Judgment Against Defendants' Invalidity Defense [Docket No. 544]; Plaintiff's Motion for Summary Judgment Against Defendants for Active Inducement of Infringement Under 35 U.S.C. § 271(B) [Docket No. 667]; Defendants' Objections to Plaintiff's Evidence Submitted in Support of its Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense [Docket No. 577]; and Defendants' Objections to Plaintiff's Evidence Submitted in Opposition to Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity [Docket No. 572].

Having read and considered the arguments presented by the parties in the papers submitted to the Court, the Court finds this matter appropriate for resolution without a hearing. The Court hereby: (1) GRANTS IN PART AND DENIES IN PART Plaintiff's Motion for Summary Judgment Against SUMCO's Invalidity Affirmative Defense; (2) GRANTS IN PART AND DENIES IN PART Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity of U.S. Patent No.

5,919,302; (3) DENIES Plaintiff's Motion for Summary Judgment against Defendants for Active Inducement of Infringement under 35 U.S.C. § 271(b); (4) DENIES AS MOOT Defendants' Motion for Summary Judgment of Zero Damages Because of No Inducement under 35 U.S.C. § 271(b); (5) SUSTAINS IN PART AND OVERRULES IN PART Defendants' Objections to Plaintiff's Evidence Submitted in Support of its Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense; and (6) SUSTAINS IN PART AND OVERRULES IN PART Defendants' Objections to Plaintiff's Evidence Submitted in Opposition to Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity.

BACKGROUND

In this patent infringement suit, Plaintiff MEMC Electronics Materials, Inc. ("MEMC") has accused defendants Mitsubishi Materials Silicon Corp., Mitsubishi Silicon America Corp., Sumitomo Mitsubishi Silicon Corp., SUMCO USA Corp. and SUMCO USA SALES Corp. (collectively, "SUMCO") of actively inducing Samsung Austin Semiconductor, L.L.C.'s ("SAS") infringement of U.S. Patent No. 5,919,302¹ (the "'302 Patent").²

MEMC is a supplier of silicon wafers to the semiconductor industry. SUMCO also produces single crystal silicon wafers for use in the fabrication of semiconductors.

A. The '302 Patent

The '302 Patent, which is entitled "Low Defect Density Vacancy Dominated Silicon," was issued on July 6, 1999 and claims an invention related to the preparation of semiconductor grade single crystal silicon, which is used, in wafer form, in the manufacture of electronic components such as integrated

¹MEMC is the assignee of record of the '302 Patent.

²MEMC originally claimed in its Complaint that SUMCO directly infringed, contributed to the infringement of, and induced infringement by others of the '302 Patent. However, on March 16, 2004, this Court granted SUMCO's Motion for Summary Judgment of Zero Damages, holding that SUMCO did not infringe the '302 Patent under any of the three theories advanced by MEMC. MEMC appealed with respect to the issues of direct infringement and active inducement of infringement. The Federal Circuit upheld the Court's ruling with respect to direct infringement, but reversed this Court with respect to the issue of active inducement of infringement. Accordingly, active inducement is the sole infringement issue left to be determined.

1 circuits. *See* 302:1:9-16.³

2 Single crystal silicon, which is the starting material for most processes for the fabrication of
3 semiconductor electronic components, is commonly prepared by what is known as the "Czochralski"
4 method. *See* 302:1:17-37. In this method, polycrystalline silicon ("polysilicon") is charged to a crucible
5 and melted, a seed crystal is brought into contact with the molten silicon, and a single crystal is grown
6 by slow extraction. *Id.* After formation of a neck is complete, the diameter of the crystal is enlarged
7 by decreasing the pulling rate and/or the melt temperature until the desired or target diameter is reached.
8 *Id.* The cylindrical main body of the crystal, which has an approximately constant diameter, is then
9 grown by controlling the pull rate and the melt temperature while compensating for the decreasing melt
10 level. *Id.* Near the end of the growth process but before the crucible is emptied of molten silicon, the
11 crystal diameter is reduced gradually to form an end-cone. *Id.* Typically, the end-cone is formed by
12 increasing the crystal pull rate and heat supplied to the crucible. *Id.* When the diameter becomes small
13 enough, the crystal is then separated from the melt. *Id.*

14 Depending on the method used to produce the crystal, certain defects can form in the crystal
15 growth chamber as the crystal cools after solidification. *See* 302:1:38-55. Such defects arise, in part,
16 due to the presence of an excess (*i.e.* a concentration above the solubility limit) of intrinsic point defects,
17 which are known as "vacancies" and "self-interstitials." *Id.* Silicon crystals grown from a melt are
18 typically grown with an excess of one or the other type of intrinsic point defect, either crystal lattice
19 vacancies ("V") or silicon self-interstitials ("I"). *Id.* The type and initial concentration of these point
20 defects in the silicon are determined at the time of solidification and, if these concentrations reach a
21 level of critical supersaturation in the system and the mobility of the point defects is sufficiently high,
22 a reaction, or an agglomeration event, will likely occur. *Id.* Agglomerated intrinsic point defects in
23 silicon can severely impact the yield potential of the material in the production of complex and highly
24

25 ³The asserted claims from the '302 Patent are cited herein as "XXX.YY" with "XXX"
26 denoting the patent number and "YY" denoting the claim number (*e.g.*, Claim 6 of the '302 Patent is
27 "302.6.") or "XXX.YY:ZZ" with "XXX" denoting the patent number, "YY" denoting the claim, and
28 "ZZ" denoting the line (*e.g.*, Claim 6 of the '302 Patent at lines 1 through 50 is "028.6.1-50.>").
Citations to the specifications for the '302 Patent are cited herein as "XXX:YY:ZZ" with "XXX"
denoting the patent number, "YY" denoting the column, and "ZZ" denoting the line (*e.g.*, column 1,
lines 5 through 8 of the '302 Patent is "302:1:5-8.>").

integrated circuits. *Id.*

Vacancy-type defects are recognized to be the origin of such observable crystal defects as: D-defects, Flow Pattern Defects ("FPDs"), Gate Oxide Integrity ("GOI") Defects, Crystal Originated Particle ("COP") Defects, crystal originated Light Point Defects ("LPDs"), as well as certain classes of bulk defects observed by infrared light scattering techniques such as Scanning Infrared Microscopy and Laser Scanning Tomography. *See* 302:1:56-67. Vacancy-type defects also include defects which act as the nuclei for ring oxidation induced stacking defaults ("OISFs"). *Id.*

Defects relating to self-interstitials are less well-studied. *See* 302:2:1-7. They are generally regarded as being low densities of interstitial-type dislocation loops or networks. *Id.* Such defects are widely recognized to be the cause of device failures usually associated with leakage problems. *Id.*

The '302 Patent discloses a process specifying initial growth conditions and the temperature range of the manufacturing process. The asserted claims of the '302 Patent are claims 1-6 and 9-12. Claim 1 is the only asserted independent claim. It reads as follows:

A single crystal silicon wafer having a central axis, a front side and a back side which are generally perpendicular to the central axis, a circumferential edge, and a radius extending from the central axis to the circumferential edge of the wafer, the wafer comprising a first axially symmetric region in which vacancies are the predominant intrinsic point defect and which is substantially free of agglomerated vacancy intrinsic point defects wherein the first axially symmetric region comprises the central axis or has a width of at least about 15 mm.

See 302.1.

Thus, every asserted claim requires the following elements:

- a single crystal silicon wafer;
- a first axially symmetric region [of the wafer] in which vacancies are the predominant intrinsic point defect and which is substantially free of agglomerated vacancy intrinsic point defects; and
- a first axially symmetric region that comprises the central axis or has a width of at least about 15 mm.

The dependent claims (claims 2-6 and 9-12) additionally require the following elements:

- a second axially symmetric region in which silicon self interstitial atoms are the predominant intrinsic point defect and which is substantially free of agglomerated silicon self-interstitial intrinsic point defects (claims 2, 4, 6, and 10);

- a first axially symmetric region that is at least about 15% of the radius (claims 3 and 4);
- a first axially symmetric region that is at least about 25% of the radius (claims 5 and 6);
- a first axially symmetric region that comprises the central axis (claims 9 and 10);
- a wafer with an oxygen content less than about 13 PPMA; and
- a wafer with an oxygen content less than about 11 PPMA.

Pursuant to this Court's *Markman* Order, the term "wafer" means "a thin, generally cylindrical, slice of semiconductor material used as a base for an electronic component or circuit." The term "a first axially symmetric region" means "a region that is symmetric about the central axis of the wafer." The term "substantially free of agglomerated vacancy [or interstitial] defects" means "a concentration of such agglomerated defects which is less than the detection limit of these defects, which is currently about 1000 defects/cm³." The term "agglomerated vacancy intrinsic point defects" means "defects caused by the reaction in which vacancies agglomerate to produce D-defects, flow pattern defects, gate oxide integrity defects, crystal originated particle defects, crystal originated light point defects, and other such vacancy related defects." Finally, "agglomerated silicon self-interstitial intrinsic point defects" means "defects caused by the reaction in which self-interstitials agglomerate to produce dislocation loops and networks, and other such self-interstitial related defects."

B. Procedural Background

On December 14, 2001, MEMC filed suit against SUMCO seeking injunctive and monetary relief from SUMCO's willful infringement of the '302 Patent.

On January 31, 2002, SUMCO filed its answer, asserting numerous affirmative defenses, including the defenses of lack of enablement, anticipation, and obviousness.

On July 10, 2002, SUMCO served MEMC with its Preliminary Invalidity Contentions.

On May 1, 2003, the Court held a claim construction hearing for the purpose of construing the claims of the '302 Patent.

On July 3, 2003, SUMCO served MEMC with its Final Invalidity Contentions. In its Final Invalidity Contentions, SUMCO identified 43 references or categories of references it alleged anticipated or rendered obvious the asserted claims.

1 On October 17, 2003, MEMC served its expert report of Luciano Mule'Stagno (the "Expert
2 Report"). The Expert Report consisted of the results of testing Mule'Stagno performed on silicon wafers
3 produced during discovery by SUMCO. It comprised seven pages of narrative opinion and almost 500
4 pages of materials relating to testing methodology and results. Based upon the testing performed and
5 described in the Expert Report, Mule'Stagno concluded that 43 of the 45 tested wafers infringed the '302
6 Patent and U.S. Patent No. 6,287,380 (the "'380 Patent") literally and under the doctrine of equivalents.
7 Up until the disclosure of the Report, MEMC had not alleged infringement of the '380 Patent.

8 On November 13, 2003, this Court granted in part and denied in part MEMC's Motion to Strike
9 Defendants' Preliminary and Final Invalidity Contentions. The Court found that SUMCO had properly
10 complied with Patent Local Rule 3-3(b) with respect to its Preliminary and Final Invalidity Contentions.
11 The Court therefore denied MEMC's Motion to Strike Defendants' Preliminary Invalidity Contentions.
12 However, the Court did find that SUMCO was in violation of the "specificity requirements of Patent
13 Local Rule 3-3(c) because the claim charts submitted by Defendants in their Preliminary and Final
14 Invalidity Contentions [were] not detailed, claim-by-claim, element-by-element claim charts." SUMCO
15 was required to serve new Final Invalidity Contentions with new claim charts, which it did by the Court-
16 ordered deadline

17 On December 8, 2003, SUMCO filed a Motion to Exclude the Expert Report and Testimony of
18 Plaintiff's Proposed Expert Luciano Mule'Stagno and to Preclude Plaintiff's Infringement Claims
19 ("SUMCO's First Motion to Exclude Expert").

20 On January 12, 2004, SUMCO served its Revised Final Invalidity Contentions ("Revised FICs").
21 In the Revised FICs, SUMCO narrowed the number of references at issue from 43 references down to
22 14.

23 On March 1, 2004, the Court issued an Order granting SUMCO's First Motion to Exclude
24 Expert. The Court granted SUMCO's motion to exclude Mule'Stagno's Expert Report and testimony
25 to the extent that it related to infringement of the '380 Patent. The Court also granted SUMCO's motion
26 to preclude MEMC from pursuing its claim of infringement under the doctrine of equivalents and
27 granted Defendants' motion to bar MEMC from offering any expert report or testimony that SUMCO
28 has infringed the '302 Patent under the doctrine of equivalents. Additionally, the Court granted

1 SUMCO's motion to strike the "claim charts" in Mule'Stagno's Expert Report but denied SUMCO's
2 motion to preclude MEMC's infringement claims.

3 Pursuant to Federal Rule of Civil Procedure 26(a)(2)(C) and (e)(1), MEMC was given an
4 opportunity to cure the defects in Mule'Stagno's Expert Report by providing objective verification of
5 Mule'Stagno's methodology. In particular, MEMC was directed to show, via objective sources, what
6 Mule'Stagno's tests were, what the results purported to show, and how the results were relevant to the
7 conclusions. MEMC was also instructed to demonstrate, via objective sources, that Mule'Stagno's
8 methodologies were generally accepted by or espoused by a recognized minority of scientists in the
9 field.

10 In response to the Court's Order, on March 9, 2004, MEMC served SUMCO with the Second
11 Declaration of Mule'Stagno. *See* Powers Decl. ISO Second Motion to Exclude Expert at Ex. 3.
12 However, on March 16, 2004, before SUMCO had a chance to respond to the Second Declaration of
13 Mule'Stagno, this Court granted SUMCO's motion for summary judgment of zero damages and
14 specifically found that SUMCO was not liable for either direct infringement, contributory infringement,
15 or active inducement of infringement. Accordingly, on April 22, 2004, the court entered a Judgment
16 of Non-infringement. MEMC subsequently appealed.

17 On August 22, 2005, the Federal Circuit issued its decision on the appeal and held that, based
18 on the fact that there was no evidence SUMCO directly sold the accused wafers in the United States,
19 this Court did not err when in granted summary judgment of zero damages on the issue of direct
20 infringement. However, the Federal Circuit held that this Court did err when it granted summary
21 judgment with respect to inducement of infringement because it found that there were genuine issues
22 of material fact with respect to whether SUMCO induced infringement of the '302 Patent on the part of
23 Samsung Austin. Accordingly, the Federal Circuit remanded the case to this Court for further
24 proceedings. Specifically, the Federal Circuit instructed this Court to determine if SAS directly
25 infringes the '302 Patent by using SUMCO's wafers in the United States, and, if so, whether SUMCO
26 actively induces SAS' infringement.

27 On November 4, 2005, SUMCO filed a Motion to Exclude the Expert Report and Testimony of
28 Plaintiffs' Proposed Expert Luciano Mule'stagno ("Second Motion to Exclude Expert").

Also on November 4, 2005, SUMCO filed a Motion for Summary Judgment of Non-Infringement and Invalidity of U.S. Patent No. 5,919,302. In the Motion, SUMCO seeks summary judgment in its favor on the following grounds: (1) the accused wafers do not infringe the asserted claims of the '302 Patent; (2) the '302 Patent is invalid under 35 U.S.C. § 112 for lack of enablement; (3) the asserted claims of the '302 Patent are invalid under 35 U.S.C. § 102(a) and (b) as anticipated by prior art publications; and (3) the asserted claims of the '302 Patent are invalid under 35 U.S.C. § 102(e), (f), or (g) based upon the prior art reflected in U.S. Patent No. 6,045,610. Additionally, SUMC filed a renewed Motion for Summary Judgment of Zero Damages.

On December 6, 2005 MEMC filed its own Motion for Summary Judgment on Defendants' Invalidity Affirmative Defense. In the Motion for Summary Judgment on Defendants' Affirmative Defense, MEMC seeks summary judgment that the asserted claims of the '302 Patent satisfy the requirements of 35 U.S.C. §§ 102, 103, and 112. Also on December 6, 2005, MEMC filed a Motion for Summary Judgment Against Defendants for Active Inducement of Infringement Under 35 U.S.C. § 271(b) ("Motion for Summary Judgment for Active Inducement").

LEGAL STANDARD

I. Summary Judgment

Under Federal Rule of Civil Procedure 56, a court may properly grant a motion for summary judgment if the pleadings and materials demonstrate that there is "no genuine issue as to any material fact and the moving party is entitled to judgment as a matter of law." *Celotex Corp. v. Catrett*, 477 U.S. 317, 322 (1986). A dispute about a material fact is genuine "if the evidence is such that a reasonable jury could return a verdict for the nonmoving party." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). Summary judgment may be granted in favor of a defendant on an ultimate issue of fact where the defendant carries its burden of "pointing out to the district court that there is an absence of evidence to support the nonmoving party's case." *Celotex*, 477 U.S. at 325; *see Johnston v. IVAC Corp.*, 885 F.2d 1574, 1577 (Fed. Cir. 1989).

To withstand a motion for summary judgment, the non-movant must show that there are genuine factual issues which can only be resolved by the trier of fact. *Anderson*, 477 U.S. at 250. The nonmoving party may not rely on the pleadings but must present specific facts creating a genuine issue

1 of material fact. *T.W. Elec. Serv. v. Pacific Elec. Contractors Ass'n*, 809 F.2d 626, 630 (9th Cir. 1987).
2 The court's function, however, is not to make credibility determinations. *Anderson*, 477 U.S. at 249.
3 The inferences to be drawn from the facts must be viewed in a light most favorable to the party opposing
4 the motion. *T.W. Elec. Serv.*, 809 F.2d at 631.

5 It is not the task of the district court to scour the record in search of a genuine issue of triable
6 fact. *Keenan v. Allen*, 91 F.3d 1275, 1279 (9th Cir. 1996). The nonmoving party has the burden of
7 identifying with reasonable particularity the evidence that precludes summary judgment. *Id.* If the
8 nonmoving party fails to do so, the district court may properly grant summary judgment in favor of the
9 moving party. *See Carmen v. San Francisco Unified School District*, 237 F.3d 1026, 1028-29 (9th Cir.
10 2001) (even if there is evidence in the court file which creates a genuine issue of material fact, a district
11 court may grant summary judgment if the opposing papers do not include or conveniently refer to that
12 evidence). Although the district court has discretion to consider materials in the court file not referenced
13 in the opposing papers, it need not do so. *Id.* at 1029. "The district court need not examine the entire
14 file for evidence establishing a genuine issue of fact." *Id.* at 1031. However, when the parties file
15 cross-motions for summary judgment, the district court must consider all of the evidence submitted in
16 support of both motions to evaluate whether a genuine issue of material fact exists precluding summary
17 judgment for either party. *The Fair Housing Council of Riverside County, Inc. v. Riverside Two*, 249
18 F.3d 1132, 1135 (9th Cir. 2001).

19 A court may grant a summary judgment motion in a patent infringement case, as in any other
20 case. *Avia Group Int'l, Inc. v. L.A. Gear Cal., Inc.*, 853 F.2d 1557, 1561 (Fed. Cir. 1988). In the context
21 of a patent infringement case, the defendant may be granted summary judgment for non-infringement
22 where the patent-holder's proof is deficient in meeting an essential part of the legal standard for
23 infringement. *ASQ Technology, Inc. v. Fortrend Engineering Corp.*, 1995 WL 590360, at *2 (N.D.Cal.
24 1995). But "in considering the [summary judgment] motion, the court must view the evidence in the
25 most favorable light to the non-movant and draw all reasonable inferences in the non-moving party's
26 favor." *Tillotson, Ltd. v. Walbo Corp.*, 831 F.2d 1033, 1037 (Fed. Cir. 1987). "[A] literal infringement
27 issue is properly decided upon summary judgment when no genuine issue of material fact exists, in
28 particular, when no reasonable jury could find that every limitation recited in the properly construed

claim either is or is not found in the accused device. *Bai v. L&L Wings, Inc.*, 160 F.3d 1350, 1353 (Fed. Cir. 1998) (citing *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 532 (Fed. Cir. 1996)).

Since summary judgment must be supported by "facts as would be admissible in evidence," *see* Fed. R. Civ. P. 56(e), scientific evidence produced in support of or in opposition to a motion for summary judgment must meet the standards of relevance and reliability articulated in *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579 (1993). *See Seaboard Lumber Co. v. United States*, 308 F.3d 1283, 1301 (Fed. Cir. 2002). The Supreme Court in *Daubert* described this inquiry as follows:

Faced with a proffer of expert scientific testimony . . . the trial judge must determine . . . whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.

509 U.S. at 590.

II. Infringement

A. Literal Infringement

A literal infringement analysis requires two separate steps. *Lacks Industries, Inc. v. McKechnie Vehicle Components USA, Inc.*, 322 F.3d 1335, 1341 (Fed. Cir. 2003); *Southwall Technologies, Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed. Cir. 1995). First, the asserted claims must be interpreted by the court as a matter of law to determine their meaning and scope. *Markman v. Westview Instruments Inc.*, 517 U.S. 370, 372-74 (1996); *Lacks*, 322 F.3d at 1341. In the second step, the trier of fact determines whether the claims as thus construed read on the accused product. *Lacks*, 322 F.3d at 1341. To establish literal infringement, every limitation set forth in a claim must be found in an accused product, exactly. *Becton Dickinson & Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 796 (Fed. Cir. 1990).

B. Active Inducement of Infringement

35 U.S.C. § 271(b) provides that: "Whoever actively induces infringement of a patent shall be liable as an infringer." *Hewlett-Packard Co. v. Bausch & Lomb*, 909 F.2d 1464, 1468 (Fed. Cir. 1990). Unlike direct and contributory infringement, which require an offer or sale within the United States, extraterritorial activity that induces infringement is prohibited by § 271(b). *Crystal Semiconductor Corp. v. Tritech Microelectronics Int'l, Inc.*, 246 F.3d 1336, 1351 (Fed. Cir. 2001). However, it is well settled

1 that there can be no inducement of infringement without direct infringement by some party. *Epcon Gas*
2 *Sys. Inc.*, 279 F.3d at 1033; *Met-Coil Sys. Corp. v. Korners Unlimited, Inc.*, 803 F.2d 684, 687 (Fed. Cir.
3 1986). Thus, upon a failure of proof of direct infringement, any claim of inducement of infringement
4 also fails. *Epcon Gas Sys. Inc. v. Bauer Compressors, Inc.*, 279 F.3d 1022, 1033 (Fed. Cir. 2002);
5 *Moleculon Research Corp. v. CBS, Inc.*, 872 F.2d 407, 410 (Fed. Cir. 1989).

6 To establish liability for inducing infringement, the patentee must prove that the alleged infringer
7 knowingly and with the requisite intent aided and abetted another's direct infringement.
8 *Warner-Lambert Company v. Apotex Corp.*, 316 F.3d 1348, 1363-64 (Fed. Cir. 2003). Thus, passive
9 conduct does not satisfy the "actively induces" element. *Beverly Hills Fan Co. v. Royal Sovereign*
10 *Corp.*, 21 F.3d 1558, 1569 (Fed. Cir. 1994) (noting that jurisdiction for a claim of inducement cannot
11 be premised on an omission because active inducement requires commission of an affirmative act).
12 Instead, active inducement is the commission of an affirmative act knowingly undertaken. *Tegal*
13 *Corporation v. Tokyo Electron Company, Ltd.*, 248 F.3d 1376, 1378-79 (Fed.Cir. 2001). "[T]he term
14 is as broad as the range of actions by which one in fact causes, or urges, or encourages, or aids another
15 to infringe a patent." *Id.* at 1379 (quoting *Fromberg, Inc. v. Thornhill*, 315 F.2d 407, 411 (5th Cir.
16 1963). The plaintiff must therefore show that the alleged infringer intended its actions to induce
17 infringing acts. Where the alleged infringer acts with knowledge of the patent, "intent additionally to
18 cause an infringement can be presumed." *MEMC Electronic Materials, Inc. v. Mitsubishi Materials*
19 *Silicon Corp., et al.*, 420 F.3d 1369, 1378 n.4 (Fed. Cir. 2005). Further, direct evidence of intent is not
20 required. "The requisite intent to induce infringement may be inferred from all the circumstances."
21 *Water Techs. Corp. v. Calco Ltd.*, 850 F.2d 660, 669 (Fed. Cir. 1988) (holding that preparing consumer
22 instructions for infringing use and exerting control through trademark license was sufficient to infer
23 intent); *Minn. Mining & Mfg. Co. v. Chemque, Inc.*, 303 F.3d 1294, 1304-05 (Fed. Cir. 2002) (holding
24 that supplying potentially infringing products along with instructions for infringing use was sufficient
25 to infer intent); *Metabolite Laboratories, Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1365 (Fed.
26 Cir. 2004) (holding that supplying product and publishing articles advocating infringing use was
27 sufficient to infer intent).

28 As a matter of law, § 271(b) does not reach actions taken before issuance of the adverse patent.

1 *National Presto Indus. v. West Bend Co.*, 76 F.3d 1185, 1196 (Fed. Cir. 1996) ("Although the tort of
 2 inducement is itself prospective, in that the direct infringement will not have occurred until after the acts
 3 of inducement, when no patent has issued at the time of the inducement there cannot be a violation of
 4 § 271(b).").

5 **III. Invalidity**

6 Patents are presumed to be valid and the burden of establishing the invalidity of a patent rests
 7 on the party asserting invalidity. *See* 35 U.S.C. § 281. The factual findings supporting a conclusion of
 8 invalidity must be proven by clear and convincing evidence. *N.V. Akzo v. E.I. DuPont de Nemours*, 810
 9 F.2d 1148, 1151 (Fed. Cir.1987). Thus, a party seeking to establish invalidity of a patent must
 10 overcome the presumption of validity with clear and convincing evidence. *Id.*

11 **A. Enablement**

12 A patent grant is issued in exchange for an enabling disclosure of an invention. *White Consol.*
 13 *Indus., Inc. v. Vega Servo-Control, Inc.*, 713 F.2d 788, 791 (Fed. Cir. 1983). The enablement
 14 requirement of 35 U.S.C. § 112, paragraph 1, provides, in relevant part, that:

15 The [patent] specification shall contain a written description of the invention,
 16 and the manner and process of making and using the [invention], in such full,
 17 clear, concise, and exact terms as to enable any person skilled in the art to
 18 which it pertains . . . to make and use the [invention].

19 35 U.S.C. § 112.

20 Enablement is determined at the time the patent application was filed. *Ajinomoto Co., Inc. v.*
 21 *Archer-Daniels-Midland Co.*, 228 F.3d 1338, 1345 (Fed. Cir. 2000), *cert. denied*, 532 U.S. 1019 (2001).
 22 Determining whether a disclosure of a patent satisfies the enablement requirement is a question of law.
 23 *Atlas Powder Co. v. E.I. DuPont de Nemours & Co.*, 750 F.2d 1569, 1576 (Fed. Cir. 1984). The legal
 24 conclusion of enablement rests on factual underpinnings. *Union Pacific Resources Co. v. Chesapeake*
 25 *Energy Corp.*, 236 F.3d 684, 690 (Fed. Cir. 2001).

26 A decision on the issue of enablement "requires determination of whether a person skilled in the
 27 pertinent art, using the knowledge available to such a person and the disclosure in the patent document,
 28 could make and use the claimed invention without undue experimentation." *Northern Telecom, Inc. v.*
Datapoint Corp., 908 F.2d 931, 941 (Fed. Cir. 1990). Factors to be considered in determining whether

a disclosure would require undue experimentation include: (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims. *In re Wands*, 858 F.2d 731 (Fed. Cir. 1988); *Enzo Biochem v. Calgene, Inc.*, 188 F.3d 1362, 1371 (Fed. Cir. 1999).

While some experimentation does not preclude enablement, the amount of experimentation must not be unduly extensive. *Atlas Powder Co.*, 750 F.2d at 1576. The test for undue experimentation allows for a considerable amount of experimentation if it is merely routine or if the patent specification provides a reasonable amount of guidance with respect to the direction in which the experimentation should proceed. *Johns Hopkins University v. CellPro, Inc.*, 152 F.3d 1342, 1360 (Fed. Cir. 1998).

B. Anticipation

In determining validity due to anticipation, the first step involves the proper interpretation of the claims. *Elmer v. ICC Fabricating, Inc.*, 67 F.3d 1571, 1574 (Fed. Cir.1995). The second step involves determining whether the limitations of the claims as properly interpreted are met by the prior art. *Id.* "Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference." *Scripps Clinic & Research Fdn. v. Genentech, Inc.*, 927 F.2d 1565, 1576 (Fed. Cir.1991) ("There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention"); *Hazani v. U.S. Intern. Trade Com'n*, 126 F.3d 1473, 1477 (Fed.Cir.1997).

An anticipation analysis involves a three-part inquiry. First, the trier of fact must determine whether the challenging reference is prior art. *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1576-78 (Fed. Cir. 1996); *Del-mar Eng'g, Lab v. United States*, 524 F.2d 1178, 1184 (Ct. Cl. 1975). Second, the fact finder must ascertain that the prior art is enabling as to put the invention in the public's possession. *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1479 (Fed. Cir. 1986), *cert. denied*, 482 U.S. 909 (1987). However, prior art patent references are presumed enabled. *In re Sasse*, 629 F.2d 675, 681 (C.C.P.A.1980). In the third step, the trier of fact must ascertain whether the doctrine of identity applies, *i.e.*, whether each element of the accused claim is present either expressly or inherently in a single prior

reference. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 771 (Fed.Cir.1983), *cert. denied*, 465 U.S. 1026 (1984).

C. Obviousness

35 U.S.C. § 103 precludes the grant of a patent that is obvious to one of skill in the art. The statute provides that:

if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

35 U.S.C. § 103. The ultimate determination of obviousness is a question of law based on underlying factual inquiries. *Richardson-Vicks Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 989 (Fed. Cir. 1988). Those factual inquiries involve consideration of the four *Graham* factors: (1) the scope and content of the prior art; (2) the differences between the claims and the prior art; (3) the level of ordinary skill in the pertinent art; and (4) any secondary considerations of nonobviousness, such as commercial success. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966); *B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582 (Fed. Cir.1996).

ANALYSIS

I. SUMCO's Objections to MEMC's Evidence

As a preliminary matter, before the Court can analyze SUMCO and MEMC's summary judgment motions, the Court must address SUMCO's Objections to Plaintiff's Evidence Submitted in Support of its Motion for Summary Judgment against Defendants' Invalidity Affirmative Defense and SUMCO's Objections to Plaintiff's Evidence Submitted in Opposition to Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity (collectively referred to herein as "SUMCO's Objections" or "Objections").⁴

⁴Due to the fact that the same documentary evidence was submitted by MEMC in support of its own Motion for Summary Judgment against Defendants' Invalidity Affirmative Defense and in opposition to SUMCO's Motion for Summary Judgment of Non-Infringement and Invalidity, SUMCO's separately filed Objections assert the exact same legal arguments and address the exact

1 In its Objections, SUMCO objects to the First, Second, Third, Fourth, Fifth, and Sixth
2 Declarations of Mule'Stagno.⁵ The Court has already considered SUMCO's arguments against the
3 Second and Sixth Declarations of Mule'Stagno, which were asserted in SUMCO's separately filed
4 Second Motion to Exclude Expert. The Court has also ruled in SUMCO's favor.⁶ Accordingly, the
5 Court SUSTAINS SUMCO's objections to the First, Second, and Sixth Declarations of Mule'Stagno for
6 the same reasons set forth in the separately filed Order granting SUMCO's Second Motion to Exclude
7 Expert and the March 1, 2004 Order. These Declarations have not been considered by the Court as
8 evidence supporting MEMC's infringement claim. As the Fourth Declaration of Mule'Stagno also
9 pertains to MEMC's infringement claim, and contains a discussion of Mule'Stagno's testing procedures
10 that is similarly vague and generalized, SUMCO's objections to it apply with equal force, and the Court
11 therefore finds that SUMCO's objections are meritorious and are also SUSTAINED.

12 With regard to the Third and Fifth Declarations of Mule'Stagno, SUMCO objects to these
13 Declarations as unqualified expert opinions, pursuant to Federal Rules of Evidence 403 and 702, and
14 on the additional grounds that the Declarations are irrelevant, lack foundation, and include hearsay.
15 However, SUMCO does not further elaborate on the specific portions of the Declarations that
16 purportedly lack foundation or consist of hearsay. Having reviewed these Declarations, the Court finds
17 that it is quite obvious that the Third and Fifth Mule'Stagno Declarations pertain to SUMCO's invalidity
18 defense and are therefore relevant. Further, since some of the testimony set forth in the Third and Fifth
19 Declarations pertains to Mule'Stagno's observations as a percipient witness, Rule 702 is not applicable
20 to all of the testimony contained in the Declarations. Having considered the Declarations, and
21 SUMCO's objections, the Court concludes that it is not appropriate to exclude the Third and Fifth
22 Mule'Stagno Declarations in their entirety based on SUMCO's vague and unsupported evidentiary

23
24
25 same factual evidence. Accordingly, the two Objections have been considered, and are herein
discussed, as if they were one filing.

26 ⁵Mule'Stagno has a PhD in Physics and has been employed by MEMC for over ten years. He
27 is currently the Manager of MEMC's Metrology & Worldwide Labs, Global Quality Organization.

28 ⁶The deficiencies of the First Declaration of Mule'Stagno were set forth in the Court's March
1, 2004 Order addressing SUMCO's First Motion to Exclude Expert.

1 objections. To the extent that some of the testimony in the Third and Fifth Declarations describes
2 Mule'Stagno's testing results, such testimony has not been considered by the Court for the same reasons
3 set forth in the Court's separate Order pertaining to SUMCO's Second Motion to Exclude Expert.
4 However, where MEMC has relied on portions of Mule'Stagno's testimony pertaining to other subjects,
5 the admissibility or relevance of that testimony is discussed and addressed in the substantive portion of
6 this Order, under the relevant legal standard. Thus, with regard to SUMCO's request that the Third and
7 Fifth Declarations of Mule'Stagno be excluded, SUMCO's objection is OVERRULED except as
8 otherwise noted in the substantive portion of the Order.

9 SUMCO also objects to: (1) the Expert Report of Robert Falster, (2) the Supplemental Report
10 of Robert Falster, (3) paragraphs 3-13 of the First Declaration of Robert Falster, (4) paragraphs 3-36 of
11 the Second Declaration of Robert Falster, and (5) paragraphs 5-15 of the Declaration of Joseph Holzer.
12 SUMCO objects to the aforementioned evidence on the grounds that it is inadmissible pursuant to Rules
13 403 and 702 of the Federal Rules of Evidence and because the evidence lacks foundation, includes
14 hearsay, and is irrelevant.⁷ Again, other than making blanket, and unsupported, assertions regarding the
15 inadmissibility of the aforementioned testimony, SUMCO does not bother to explain to the Court which
16 testimony is hearsay, which testimony is irrelevant, and which testimony lacks foundation. Instead, the
17 essence of SUMCO's objection appears to be that Falster and Holzer's testimony and reports must be
18 excluded because Falster and Holzer are the inventors of the '302 Patent and, thus, their testimony is
19 "inherently unreliable." SUMCO also argues that Falster and Holzer's testimony regarding enablement,
20 conception, and reduction to practice must be excluded because it is uncorroborated oral testimony by
21 an interested party. While it is true that inventor testimony regarding conception or reduction to practice
22 must be corroborated, this is not a basis for excluding the inventors' testimony in its entirety, since the
23 same testimony may also bear on, or be relevant to, other dispositive issues in the instant summary
24 judgment motions. Further, the weight to be given to Falster and Holzer's testimony is most properly

25
26 ⁷SUMCO also contends that the Supplemental Report of Robert Falster should be excluded
27 as untimely. However, since SUMCO concedes that it received the report on January 31, 2004, it is
28 clear that SUMCO has not been unduly prejudiced by the initial delay. Further, since the parties
have asked that the Court resolve this case through summary judgment, the interests of justice
warrant full consideration of all of the admissible evidence presented to the Court. The Court
therefore declines to exclude the Supplemental Report of Robert Falster on this basis.

1 addressed under the relevant legal standard and in the substantive portion of this Order. Additionally,
2 SUMCO has not provided the Court with any basis to conclude that Falster and Holzer are anything
3 other than qualified experts in the semiconductor industry. Accordingly, SUMCO's objections to the
4 Falster and Holzer testimony are **OVERRULED** except as otherwise noted in the substantive portion
5 of this Order.

6 Finally, the Court notes that SUMCO objects to Exhibit 11 of the Mathiowetz Declaration,
7 submitted by MEMC in support of its Motion for Summary Judgment Against Defendants' Invalidity
8 Affirmative Defense. As MEMC points out, however, Exhibit 11 is not evidence, it is merely a
9 summary of MEMC's arguments that MEMC prepared in order to crystallize MEMC's arguments for
10 the Court. Accordingly, SUMCO's evidentiary objections are inappropriate and are therefore
11 **OVERRULED**. Having resolved the evidentiary objections, the Court now turns to the substance of the
12 summary judgment motions.

13 **II. Infringement**

14 **A. Literal Infringement**

15 As a threshold matter, the first issue that this Court must determine with respect to three of the
16 four summary judgment motions pending before the Court⁸ is whether the accused wafers literally
17 infringe the '302 Patent. The "accused wafers" in this litigation are the wafers allegedly supplied by
18 SUMCO to SAS under Samsung Specification PWP10725S2. MEMC's Motion for Summary Judgment
19 Against Defendants for Active Inducement of Infringement is premised on the argument that the accused
20 wafers literally infringe the '302 Patent. In its own Motion for Summary Judgment of Non-Infringement
21 and Invalidity, SUMCO argues that it is entitled to a summary judgment finding that the '302 Patent is
22 *not* infringed by the accused wafers. SUMCO asserts the following alternative bases for a finding of
23 non-infringement: (1) the accused wafers do not include an "axially symmetric region;" (2) MEMC has
24 failed in its burden of proving that there are less than about 1,000 defects/cm³ in the accused wafers and
25 thus MEMC has not proven that the accused wafers are substantially free of agglomerated vacancy

26
27 ⁸The three motions that are implicated by the Court's assessment of MEMC's infringement
28 claim are: (1) SUMCO's Motion for Summary Judgment of Non-Infringement and Invalidity; (2)
MEMC's Motion for Summary Judgment Against Defendants for Active Inducement of
Infringement; and (3) SUMCO's Motion for Summary Judgment of Zero Damages.

1 intrinsic point defects; (3) the areas in the accused wafers that MEMC claims are agglomerated vacancy
2 intrinsic point defects are actually "low-temperature centers of oxygen precipitation" areas; and (4) the
3 "vacancies" in the accused wafers cannot be the "predominant intrinsic point defect" since, at room
4 temperature, there are no vacancy or interstitial intrinsic point defects.

5 MEMC, on the other hand, argues that it can prove literal infringement on each of the bases
6 asserted by SUMCO based on either (1) the testing conducted by MEMC's expert, Mule'Stagno; (2)
7 admissions made by SUMCO's experts; (3) SUMCO's own testing results; or (4) two papers published
8 by Park and two SUMCO employees, Furuya and Harada.

9 MEMC has the burden of proving patent infringement. *See Carroll Touch, Inc. v. Electro Mech.*
10 *Sys., Inc.*, 15 F.3d 1573, 1578 (Fed. Cir. 1993). To prove infringement, MEMC must show that *all*
11 elements of the asserted claims are present in the accused wafers, literally. If the undisputed facts show
12 that even one element is missing from the accused wafers, SUMCO is entitled to a summary judgment
13 finding of non-infringement. *Lemelson v. U.S.*, 752 F.2d 1538, 1551 (Fed. Cir. 1985).

14 **1. Axial Symmetry**

15 In response to SUMCO's first argument of non-infringement, MEMC contends that the facts
16 establish that the accused wafers are "substantially" axially symmetric, and that this is all that is required
17 by the '302 Patent. In support of its argument, MEMC relies on the following evidence: (1)
18 Mule'Stagno's test results, and (2) assumptions made by certain third parties regarding the prior art.
19 MEMC further argues that SUMCO's witnesses have admitted that all silicon grown by the Czochralski
20 method is substantially axially symmetric.

21 In response to SUMCO's separately filed Second Motion to Exclude Expert, the Court has
22 already evaluated the evidence and testimony submitted by Mule'Stagno and has determined that it
23 should be excluded as unverified and unreliable. Accordingly, MEMC may not rely on Mule'Stagno's
24 test results to establish that the accused wafers are axially symmetric.⁹

25
26 ⁹Indeed, if the Court were to consider Mule'Stagno's Second Declaration, and the test results
27 reported therein, the Court would also have to consider SUMCO's argument that some of the testing
28 performed by Mule'Stagno indicates that the accused wafers are *not* axially symmetric. As SUMCO
points out, the Lifetime images are the only tests performed by Mule'Stagno that indicate the shape
of the vacancy and interstitial dominated regions across the whole wafer. SUMCO argues that these

Further, contrary to MEMC's assertions, SUMCO is not arguing that the '302 Patent requires "perfect" symmetry. However, as SUMCO points out, the term "axially symmetric region" was emphasized in arguments made to the United States Patent Office to *define over* the prior art. *See* Powers Decl. ISO Mot. of Non-Infring. at Ex. 8 (King Decl. at ¶¶ 4-6). Thus, a finding of infringement requires a showing that regions in the accused wafers are at least approximately "axially symmetric" as shown in Figure 5 or as described in Column 8 of the '302 Patent. MEMC has not come forth with any evidence sufficient to prove that the accused wafers contain such axially symmetric regions.

In fact, MEMC's argument depends solely on evidence that does not prove what MEMC contends that it proves. For example, MEMC cites to a written analysis of the '302 Patent by SUMCO's expert Eidenzon in which Eidenzon states that "[s]ome crystal regions can be substantially free from agglomerated v and I [and] these regions always are axially symmetric due to cylindrical symmetry of the ingots." Mathiowetz Decl. ISO Opp. to Mot. re Non-Infring. at Ex. 4 (emphasis in original omitted). However, as SUMCO has pointed out, another SUMCO expert, Wildes, has clarified that Eidenzon's statement refers to the prior art and was made prior to the Court's *Markman* ruling. *Id.* at Ex. 8 (Wildes Depo. at 75:6-76:21). The other statements made by Eidenzon that are identified in MEMC's briefs are also references to the prior art and thus do not conclusively establish that the *accused wafers* are axially symmetric within the meaning of the '302 Patent. *See id.* at Ex. 5 (Eidenzon Depo. at 14: 16-23, 39:7-13). Accordingly, on this basis, SUMCO is entitled to summary judgment in its favor on the issue of literal non-infringement.

2. Substantially Free of Agglomerated Vacancy Intrinsic Point Defects

SUMCO has also persuasively established that MEMC has not shown that the accused wafers meet the claim limitation requiring that the wafers have a region in which "vacancies are the predominant intrinsic point defect" and that is "substantially free of agglomerated vacancy intrinsic point defects." As noted previously, pursuant to the Court's claim construction, to prove that the region is "substantially free of agglomerated vacancy intrinsic point defects," MEMC must show that the

Lifetime maps show very irregular, non-symmetrical regions. Although Mule'Stagno claims that the irregular color patterns are due to "noise," he does not provide any objective verification for this assertion. Further, as SUMCO notes, Mule'Stagno's BMD testing at 90° and 180° show very irregular radial density patterns.

1 accused wafers have a region in which the concentration of agglomerated vacancy intrinsic point defects
2 is less than about 1,000 defects/cm³.

3 MEMC's sole evidence that this claim limitation has been met is: (1) the Flow Pattern Defect
4 ("FPD") testing set forth in Mule'Stagno's Expert Report;(2) certain statements made by Park and two
5 SUMCO employees; and (3) SUMCO's test data and witness admissions. Again, however, this Court
6 has already determined that Mule'Stagno's Expert Report must be excluded because MEMC has not
7 sufficiently established that Mule'Stagno's testing methods are reliable. The bare and unsupported
8 assertions set forth in Mule'Stagno's Expert Report, as well as his Sixth Declaration, with regard to FPD
9 testing only serve to further underscore this Court's conclusion that the testimony must be excluded.

10 For example, it appears from Mule'Stagno's Second Declaration that he only scanned one quarter
11 of each wafer in order to determine whether the accused wafer contains agglomerated defects.
12 *See* Powers Decl. ISO Second Mot. to Exclude Expert at Ex. 3. However, there are no objective sources
13 identified in Mule'Stagno's Second Declaration showing that such a methodology is appropriate or
14 reliable. *Id.* Further, Mule'Stagno admits that he detected certain flow pattern activity in the accused
15 wafers but concludes, without any support or explanation, that such activity is due to "contamination"
16 or "damage" rather than the presence of agglomerated vacancy defects. *Id.* Further, and most
17 importantly, Mule'Stagno admits in his Sixth Declaration that the detection limit for a single view
18 through a 50 power microscope, which is the method used by Mule'Stagno to perform the test, is 3,300
19 defects per cubic centimeter. *See* Mathiowetz Decl. ISO Opp. to Second Mot. to Exclude Expert at Ex.
20 14. While Mule'Stagno contends that he nevertheless performed the test in such a way as to "reduce"
21 the detection limit to the limit required by the '302 Patent, his sole support and explanation for this
22 altered methodology is as follows:

23 The problem with SUMCO's argument is that I personally performed many
24 more views that just one isolated view through a microscope. For three side-
25 by-side views through the microscope, three times as much silicon is etched
26 which reduces the detection limit by one third, *i.e.* reduces the detection limit
27 to 1100 defects per centimeter cubed. 1100 defects per centimeter cubed is the
28 detection limit recited in the '302 patent ("about 1000 per centimeter cubed").
But here, I performed many more than even three views through the
microscope which would lower the detection limit even further and would
certainly meet the detection limit recited in the '302 patent.

Id. Thus, MEMC expects the Court to conclude that it has proven literal infringement based on

Mule'Stagno's completely unsupported and unscientific explanation that he performed "many more views than just one isolated view" and that performing "many" views is the appropriate method of meeting a detection limit of about 1,000 defects per cubic centimeter.¹⁰ This is exactly the type of imprecise and unscientific testimony that is inadmissible under *Daubert*. See *Novartis Corp. v. Ben Venue Laboratories, Inc.*, 271 F.3d 1043, 1051 (Fed. Cir. 2001) ("[T]he expert must set forth the factual foundation for his opinion in sufficient detail for the court to determine whether that factual foundation would support a finding of infringement under the claim construction adopted by the court") (internal quotations omitted).

MEMC's arguments regarding the articles published by Park, Furuya, and Harada are similarly conclusory and, thus, similarly flawed. For example, citing the two articles authored by Park, Furuya, and Harada, MEMC contends that the authors "expressly found that 'pure silicon' wafers made by the Czochralski ("CZ") method, *i.e.* the accused wafers in this litigation, are free of agglomerated defects." See MEMC Opp. to Mot. re Non-Infring. at 7. However, in order for this statement to prove infringement, MEMC would have to show that the authors are, in fact, specifically discussing the accused wafers. However, instead of proving this, MEMC merely asks the Court to assume it. Moreover, although MEMC also concludes that the authors' "scientific methodology for reaching this conclusion was the same as that used by Dr. Mule'Stagno in his expert report," they do not provide the Court with any evidence that this statement is true, other than Mule'Stagno's own vague and unsupported assertions. Further, MEMC does not cite to any evidence or testimony sufficient to show that Park, Furuya, and Harada are discussing wafers that have a region in which the concentration of agglomerated vacancy intrinsic point defects is less than about 1,000 defects/cm³. In fact, there is no discussion of this specific detection limit in the articles MEMC has identified. See Mathiowetz Decl. ISO Opp. to Mot. re Non-Infring. at Exs. 11, 12.

Next, MEMC argues that SUMCO's own evidence establishes that the accused wafers literally infringe. Specifically, MEMC states that SUMCO has produced a spreadsheet that *proves* that the

¹⁰Further, since MEMC has produced no objective verification that "1,100 defects per centimeter cubed" is equivalent to the limitation of "about 1,000 defects per centimeter cubed," it appears that MEMC expects the Court to overlook the fact that even Mule'Stagno admits that he did not meet the test limit required to prove infringement of the '302 Patent.

1 accused wafers are "substantially free of agglomerated vacancy intrinsic point defects." *See* Mathiowetz
2 Decl. ISO Mot. re Active Induc. at Ex. 10. However, as SUMCO points out, MEMC has produced no
3 evidence – such as deposition testimony from the author of the spreadsheet – that sheds any light on
4 what is actually reflected in the spreadsheet. Instead, MEMC offers the Court its own speculation and
5 conjecture as to what is reflected in the report. This is completely insufficient to support a finding of
6 literal infringement. For example, while it is true that the spreadsheet contains "0's" (zero's) in the
7 columns entitled "D defects" and "OISF," there is nothing in the spreadsheet that shows: (1) the type
8 of test that was performed, or (2) that the test was scientific or reliable, or (3) that the wafers were tested
9 at the detection limit required by the '302 Patent. Accordingly, this evidence is insufficient to support
10 MEMC's Motion for Summary Judgment of Active Inducement and does not create a genuine issue of
11 fact sufficient to preclude the granting of summary judgment to SUMCO on its own Motion for
12 Summary Judgment of Non-Infringement and Invalidity.

13 Similarly, the SUMCO witness "admissions" that MEMC contends prove literal infringement
14 are so vague that they provide no assistance to the Court in determining the issue of literal infringement.
15 For example, in its Reply brief, MEMC alleges, for the first time, that Wildes' deposition testimony
16 proves that the accused wafers are "substantially free of agglomerated vacancy intrinsic point defects."
17 However, the sum total of Wildes' testimony is as follows:

18 Q: But it is fair to say, isn't it, that you are aware that many of the accused
19 wafers that [are] vacancy dominant have no OISF ring?

20 A: Yes.

21 *See* Mathiowetz Decl. ISO Opp. to Mot. to Exclude Expert at Ex. 11 (Wildes Depo. at 92:23-93:1). All
22 that this testimony proves – if it proves anything at all – is that some of the accused wafers lack one type
23 of vacancy defect, the OISF ring. This is a far cry from proving that the accused wafers Wildes is
24 referring to have "a single crystal silicon wafer having a central axis, a front side and a back side which
25 are generally perpendicular to the central axis, a circumferential edge, and a radius extending from the
26 central axis to the circumferential edge of the wafer, the wafer comprising a first axially symmetric
27 region in which vacancies are the predominant intrinsic point defect and which is substantially free of
28 agglomerated vacancy intrinsic point defects wherein the first axially symmetric region comprises the

1 central axis or has a width of at least about 15 mm," which is what is claimed in claim 1 of the '302
2 Patent.

3 MEMC reliance on Furuya's deposition testimony is similarly misplaced. *See Mathiowetz Decl.*
4 *ISO Mot. re Active Induc. at Ex. 2 (Furuya Depo. at 371:16-375:11).* For example, it is clear from
5 Furuya's deposition testimony that his "conclusions" regarding the accused wafers are based, at least in
6 part, on speculation:

7 Q: When we have that construction, does the vacancy rich material on the
8 inside or the outside of the wafer have any COP defects?

9 A: In pure silicon there is no COP.

10 Q: Do you know what percentage of the pure silicon wafers sold by SUMCO
11 in the last few years have been made up of vacancy rich material from the
12 center to the edge?

13 A: Based on the information that I was able to obtain when I worked in
14 Engineering Technology, I can say something, but is that – is that okay?

15 Q: Sure.

16 A: I'm not sure about the accurate number, but in very simple terms one
17 possibility is that they were one-third each, those three types that we discussed,
18 we talked about.

19 Q: So one-third of the pure silicon wafers were vacancy rich from center to
20 edge, and one-third were interstitial rich from center to edge, and one-third had
21 vacancy rich material at the center that was surrounded by either I [interstitial]
22 rich material or else I [interstitial] rich material and vacancy rich material?

23 A: Yeah, simply put, but there's a chance that the I [interstitial] rich silicon had
24 a little bigger share. That's just as a possibility. It all depends on – the same
25 thing can be said of all three types, actually, as a possibility.

26 Q: That all three types may be a little more or a little less than a third?

27 A: Yes, just – it's my speculation.

28 *Id.* at Ex. 2 (Furuya Depo. at 374:7-375:11). Further, with regard to the portions of Furuya's testimony
that may not be based on speculation, MEMC does not provide the Court with any additional testimony
from Furuya indicating that the wafers were tested at the detection limit required by the '302 Patent.
Additionally, Furuya's single statement regarding the lack of COP defects in pure silicon does not come
close to establishing that the accused wafers were substantially free of all agglomerated vacancy
intrinsic point defects or that the wafers had a single crystal silicon wafer having a central axis, a front

1 side and a back side which are generally perpendicular to the central axis, a circumferential edge, and
2 a radius extending from the central axis to the circumferential edge of the wafer, the wafer comprising
3 a first axially symmetric region in which vacancies are the predominant intrinsic point defect and which
4 is substantially free of agglomerated vacancy intrinsic point defects wherein the first axially symmetric
5 region comprises the central axis or has a width of at least about 15 mm. Again, in order to prove literal
6 infringement, MEMC must show that each limitation of this claim is met by the accused wafers,
7 literally. SUMCO's witness testimony is therefore also insufficient to support MEMC's Motion for
8 Summary Judgment of Active Inducement and does not create a genuine issue of fact sufficient to
9 preclude the granting of summary judgment to SUMCO on its own Motion for Summary Judgment of
10 Non-Infringement and Invalidity.

11 In sum, MEMC has not cited any admissible evidence that establishes that any one of the
12 accused wafers is "substantially free" of all agglomerated vacancy defects under the definition set forth
13 in the '302 Patent, *i.e.*, less than about 1,000 defects/cm³. Accordingly, SUMCO is entitled to summary
14 judgment in its favor on the issue of literal non-infringement on this basis as well.

15 3. Vacancy Intrinsic Point Defects

16 SUMCO also argues that the '302 Patent is not met by the accused wafers because the areas in
17 the accused wafers that MEMC claims are agglomerated vacancy intrinsic point defects are actually
18 "low-temperature centers of oxygen precipitation" (or "LTC") areas and, since LTC areas are found in
19 the prior art publications of Eidenzon and Puzanov, as a matter of law, the accused wafers cannot
20 infringe the '302 Patent. The Court has disregarded this argument as unpersuasive. As MEMC points
21 out, a "practicing the prior art" argument is not a valid defense to literal infringement. *Ecolab, Inc. v.*
22 *Paraclipse, Inc.*, 285 F.3d 1362, 1377 (Fed. Cir. 2002). This is due to the fact that the issues of
23 infringement and invalidity are separate issues, each with its own burden of proof.

24 4. Vacancies as the Predominant Intrinsic Point Defect

25 With respect to its fourth argument, SUMCO argues that the "vacancies" in the accused wafers
26 cannot be the "predominant intrinsic point defect" since, at room temperature, there are no vacancy or
27 interstitial intrinsic point defects. Again, as MEMC points out, this argument makes little sense and is
28 contrary to both the Court's construction of the '302 Patent and the basic understanding of those skilled

1 in the art. Indeed, it is commonly accepted that silicon may contain both interstitial defects and vacancy
2 defects. Further, the fact that oxygen clusters with vacancies as the crystal cools to room temperature
3 in the vacancy dominated agglomerated defect-free material does not change the fact that there may be
4 more vacancies than self-interstitials in the material at room temperature. Accordingly, the Court has
5 not relied on this argument in concluding that the '302 Patent is not infringed.

6 **5. MEMC's Repudiation of its Infringement Contentions**

7 As a final matter, the Court notes that SUMCO also argues that it is entitled to a finding of non-
8 infringement because MEMC has repudiated the sole basis for literal infringement alleged in its Final
9 Infringement Contentions. This argument is premised on the fact that the principal named inventor of
10 the '302 Patent, Falster, has stated that: "The Samsung Specification No. PWP10725S2 does not
11 inherently teach any wafer covered by any of the asserted claims." See Powers Decl. ISO Opp. to Mot.
12 re Active Induc. at Ex. 6. It is also based on the fact that MEMC stated in its reply brief to the Court
13 of Appeals for the Federal Circuit that: "Since the '302 patent requires silicon regions substantially free
14 of such agglomerated defects, wafers that meet the PWP10725S2 specification do not necessarily
15 infringe the '302 patent." *See id.* at Ex. 7.

16 MEMC contends that these admissions are irrelevant because MEMC is merely arguing that
17 most, but not all, of SUMCO's wafers made according to Specification PWP10725S2 infringe the
18 asserted claims. It is true that ordinarily a plaintiff need not prove that every single product made by
19 the defendant infringes its patent. *See Bell Comm. Research, Inc. v. Vitalink Comm. Corp.*, 55 F.3d 615,
20 622-23 (Fed. Cir. 1995) ("[A]n accused product that sometimes, but not always, embodies a claimed
21 method nonetheless infringes."). In this case, however, MEMC has specifically alleged in its
22 Preliminary Infringement Contentions, which became its Final Infringement Contentions, that wafers
23 meeting Specification PWP10725S2 *do* necessarily infringe. *See* Powers Decl. ISO Mot. re Non-
24 Infring. at Ex. 5 (MEMC Preliminary Infringement Contentions). MEMC does not provide any
25 explanation to the Court as to how this discrepancy can be reconciled. Thus, MEMC's admissions are
26 very damaging to its case. Indeed, such admissions strengthen the Court's finding that MEMC has not
27 met its burden of proof with respect to the issue of literal infringement. Accordingly, the Court hereby
28 GRANTS SUMCO's Motion for Summary Judgment of Non-Infringement and Invalidity and DENIES

MEMC's Motion for Summary Judgment Against Defendants for Active Inducement. The Court therefore also DENIES SUMCO's Motion for Summary Judgment of Zero Damages as MOOT.

III. Invalidity

In its Motion for Summary Judgment of Non-Infringement and Invalidity, SUMCO seeks summary judgment in its favor on the following affirmative defenses: (1) the '302 Patent is invalid under 35 U.S.C. § 112 for lack of enablement; (2) the asserted claims of the '302 Patent are invalid under 35 U.S.C. § 102(a) or (b) as anticipated by certain prior art publications; and (3) the asserted claims of the '302 Patent are invalid under 35 U.S.C. § 102(e), (f), or (g) as anticipated by the '610 Patent.

In its own cross-Motion for Summary Judgment, Plaintiff seeks summary judgment that the '302 Patent is valid and satisfies the requirements of 35 U.S.C. §§ 102, 103, and 112.

A. Enablement

In support of its Motion for Summary Judgment of Non-Infringement and Invalidity, SUMCO alleges that the '302 Patent is invalid for lack of enablement because: (1) it does not disclose any method or apparatus for obtaining a "first axially symmetric region in which vacancies are the predominant intrinsic point defect and which is substantially free of agglomerated vacancy intrinsic point defects wherein the first axially symmetric region comprises the central axis or has a width of at least about 15 mm" and (2) it does not describe any method or approach for forming a "second axially symmetric region in which silicon self-interstitial atoms are the predominant intrinsic point defect and which is substantially free of agglomerated silicon self-interstitial intrinsic point defects."

MEMC opposes SUMCO's Motion and, in turn, argues in its own Motion for Summary Judgment against Defendants' Invalidity Affirmative Defense that the '302 Patent satisfies the enablement requirement of 35 U.S.C. § 112. Since SUMCO is asserting lack of enablement as an affirmative defense, SUMCO bears the burden of establishing invalidity by clear and convincing evidence. *N.V. Akzo*, 810 F.2d at 1151.

1. Background Pertaining to the '302 Patent

According to MEMC, the '302 Patent teaches one skilled in the art how to extend the time that a silicon crystal cools from its solidification temperature down to about 1050°C so that point defect concentrations fall below the level at which agglomeration occurs. The initial type and concentration

1 of point defects at the melt interface in growing silicon is determined by the ratio v/G , where " v " is the
2 pull rate or velocity at which the crystal is being pulled from the melt and " G " is the temperature
3 gradient in the direction of the growth of the crystals near the interface between the molten and solid
4 silicon. By extending the relevant time period, the concentrations of point defects are reduced. MEMC
5 asserts that the '302 Patent describes this process of extended cooling and that column 6, lines 6-18 of
6 the '302 Patent teach that the critical v/G_0 value is $2.1 \times 10^{-5} \text{ cm}^2/\text{sK}$. *See* 302:6:6-18.

7 According to MEMC, the '302 Patent further teaches one skilled in the art that if the critical
8 value of v/G_0 is reached at some point along the radius of the silicon wafer, there will be a V/I boundary
9 where the silicon changes from vacancy dominated to interstitial dominated. *See* 302:7:59 -8:1. The
10 '302 Patent also teaches that agglomeration reactions can occur as a silicon crystal cools. According
11 to MEMC, column 7, lines 1 through 25 of the '302 Patent teach that the concentration of vacancies and
12 interstitials becomes increasingly supersaturated as the crystal cools and, if a critical supersaturation
13 concentration is reached, the agglomeration reaction occurs. *See* 302:7:1-25.

14 Also according to MEMC, the '302 Patent discloses controlled cooling in order to "balance" any
15 out-of-balance initial concentrations, thereby creating wide, practical and stable "windows" for perfect
16 crystal growth. For example, MEMC contends that at column 7, lines 44 through column 8, line 23 of
17 the '302 Patent, it is disclosed that the rate at which the silicon crystal cools from the solidification
18 temperature down to the temperature at which agglomeration reactions can occur may be extended to
19 allow redistribution and suppression of vacancies and silicon self-interstitials to prevent agglomerated
20 vacancy and agglomerated self-interstitial defects from forming. *See* 302:7:44-8:23. MEMC further
21 contends that the '302 Patent teaches that the initial concentrations may be suppressed by controlling
22 the period of time the crystal is maintained above 1050°C to allow greater time for out-diffusion of
23 intrinsic point defects to the surface and for diffusion and recombination of interstitials and vacancies
24 ("self-annihilation") at the V/I boundary inside the silicon crystal. *See* 302:7:44-58.

25 MEMC also alleges that the '302 Patent describes how to extend the cooling time from the
26 solidification temperature down to about 1050°C to form silicon wafers having large vacancy dominated
27 agglomerated vacancy defect free regions and interstitial dominated agglomerated interstitial defect free
28 regions. For example, MEMC asserts that, at column 9, lines 33-49 of the '302 Patent, it is described

1 how the crystal is cooled from the solidification temperature down to about 1050°C over a period of time
2 ranging from 5 to 75 hours. *See* 302:9:33-49. MEMC also asserts that the '302 patent teaches that by
3 slow cooling a crystal having a V/I boundary, a diffusion and recombination of point defects at the V/I
4 boundary can sufficiently suppress the initial concentrations of the point defects such that the
5 agglomeration reaction does not occur. *See* 302:8:9-23. Additionally, MEMC asserts that the '302
6 Patent teaches that interstitials diffuse faster than vacancies, and, as such, the diffusion and
7 recombination at the V/I boundary causes movement of the V/I boundary during cooling. *See*
8 302:8:9-23. MEMC further contends that at column 9, line 60 through column 10, line 3 of the '302
9 Patent, the design criteria for v/G0 tolerance and cooling history is disclosed. MEMC also contends that
10 this design criteria is described at column 20, lines 40 through 52.

11 Additionally, MEMC asserts that Figures 16b and 23 of the '302 Patent show images of axial
12 slices taken from two single crystal ingots grown under the controlled cooling conditions described in
13 the '302 Patent.

14 2. SUMCO's Arguments in Support of a Finding of Lack of Enablement

15 SUMCO does not dispute that the '302 Patent contains descriptions and disclosures regarding
16 temperature gradient, pull rate, and cooling time, but argues that these principles were well known prior
17 to the issuance of the '302 Patent and that the '302 Patent specification only generally describes the
18 requisite combinations of temperature gradient, pull rate, and cooling time. SUMCO further argues that
19 merely providing a description of the necessary ratio and requirement for slow cooling does not convey
20 to one of ordinary skill in the art *how* to accomplish or maintain the desired ratio during cooling. To
21 provide the Court with clear and convincing evidence supporting these allegations, SUMCO has
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submitted the declarations of three experts, Eidenzon,¹¹ Wildes,¹² and Park.¹³ MEMC has not objected to the admissibility of these declarations and does not dispute that Eidenzon, Wildes, and Park are experts of ordinary skill in the silicon industry.

Eidenzon states that she has reviewed the '302 Patent and has concluded that the '302 Patent does not disclose how to make the silicon wafer that is described in the asserted claims of the '302 Patent. Powers Decl. ISO Mot. re Non-Infring. at Ex. 5 (Eidenzon Decl. at ¶¶ 2-4). Eidenzon also points out that the examples used in the '302 Patent specification are ambiguous. For example, most of the defect patterns demonstrated in the patent specification (*e.g.*, Figures 6, 8, 14, 20, 21, 22, and 23) suggest that the agglomerated intrinsic point defects are present in both the vacancy- and interstitial-dominant regions. *Id.* at Ex. 5 (Eidenzon Decl. at ¶ 5). However, the only example with a vacancy-rich agglomerate free area is shown in Figures 16a and b. *Id.* With respect to these figures, the '302 Patent does not provide any direct evidence that the surrounding area is free of interstitial agglomerated point defects. *Id.* Further, according to Eidenzon, the '302 Patent specification does not adequately describe how the vacancy dominant or interstitial dominant symmetric regions are made, especially with respect to the width or length limitations. Overall, due to this lack of specificity, Eidenzon concludes that "the '302 Patent is useless to anyone working in this field." *Id.* at Ex. 5 (Eidenzon Decl. at ¶ 9). She further states that "[e]ven with all my expertise, I cannot find the details in the '302 patent that would be required to create defect-free silicon growth as claimed." *Id.* at Ex. 5 (Eidenzon Decl. at ¶ 10).

¹¹Eidenzon has a PhD in material science and engineering from the Moscow Institute of Steel and Alloys. *See* Powers Decl. ISO Mot. re Non-Infring. at Ex. 5 (Eidenzon Decl. at ¶ 1). For more than thirty years, she worked at the Podolsk Chemical and Metallurgical Plant, where she took part in research of silicon crystal growth, defect properties, and developing technology for silicon crystals with desired properties. *Id.* Except for the fact that she has been retained as an expert in this litigation, Eidenzon is not otherwise affiliated with SUMCO.

¹²Wildes has a PhD in Physical Organic Chemistry from the University of North Carolina. *See* Powers Decl. ISO Mot. re Non-Infring. at Ex. 4 (Wildes Decl. at ¶ 1). Since 1986, his professional and research interests have focused on various aspects of silicon wafers including crystal growing. *Id.* Wildes is currently an employee of SUMCO USA. *Id.*

¹³Park obtained his Doctorate Degree in Materials Science and Engineering from North Carolina State University in 1994 and is currently a Professor at the Hanyang University in Seoul, Korea. *See* Powers Decl. ISO Mot. re Non-Infring. at Ex. 1 (Park Decl. at ¶ 1, 2). He is also the director of the Advanced Semiconductor Material & Device Development Center at Hanyang University. *Id.* Additionally, Park is the inventor of U.S. Patent No. 6,045,610.

1 Wildes agrees that the '302 Patent does not teach silicon wafers that are entirely vacancy
2 dominant and substantially agglomerate free across the surface of the wafer. *Id.* at Ex. 4 (Wildes Decl.
3 at ¶ 10). In particular, Wildes takes issue with MEMC's assertion that Figure 23 and column 22, lines
4 60 to 64 disclose such wafers. *Id.* According to Wildes, the crystal described in those sections of the
5 '302 Patent was grown using the method disclosed by Voronkov in 1982. *Id.* Wildes asserts that the
6 Voronkov method is precisely what is described in column 7, lines 32-43 of the '302 Patent and
7 summarily dismissed as too "difficult to achieve." *Id.* Wildes further asserts that the only other
8 references in the '302 Patent that describe regions that are equal to the radius of the ingot and are
9 substantially free of agglomerated defects are references to material that is partially or entirely
10 interstitial. *Id.* Thus, Wildes concludes that the '302 Patent does not disclose a region of vacancy
11 dominant, substantially agglomerate free material that extends across the entire surface of the wafer.
12 *Id.*

13 Park has also stated that he has reviewed the '302 Patent and has concluded that it is flawed
14 because it does not even refer to or acknowledge the 1982 publication of Voronkov, which teaches that
15 a region can be formed in which vacancies are the predominant intrinsic point defect and which is
16 substantially free of agglomerated defects. Powers Decl. ISO Mot. re Non-Infring. at Ex. 1 (Park Decl.
17 at ¶¶ 15-16). According to Park, the Voronkov publication also teaches that a region can be formed in
18 which silicon self-interstitial atoms are the predominant intrinsic point defect and which is substantially
19 free of agglomerated silicon self-interstitial intrinsic point defects. *Id.*

20 Additionally, and most importantly, both Eidenzon and Wildes opine that the '302 Patent is
21 invalid for lack of enablement because its description of the hot zone design is "too generic" and thus
22 the patent does not adequately disclose the required hot zone. *See* Powers Decl. ISO Mot. re Non-
23 Infring. at Exs. 4 (Wildes Decl. at ¶¶ 5-6) and Ex. 5 (Eidenzon Decl. at ¶¶ 6-10). According to Wildes,
24 the "hot zone design is critical to the manufacturing of silicon wafers[.]" *Id.* at Ex. 4 (Wildes Decl. at
25 ¶ 4). In fact, Wildes contends that the hot zone design is such a significant part of the manufacturing
26 process that "MSIL spent many millions of dollars in designing a hot zone, including the modeling and
27 simulation methodology, in order to satisfy the requirements of Samsung Specification PWP10725S2."
28 *Id.* Further, Eidenzon has stated that "[i]t is very difficult to produce defect-free silicon even with a

1 well-designed hot zone and with substantial modeling and simulation expertise." *Id.* at Ex. 5 (Eidenzon
2 Decl. at ¶ 10). Accordingly, SUMCO's experts conclude that the absence of any disclosure regarding
3 the necessary hot zone design renders the '302 Patent invalid because it means that a person skilled in
4 the pertinent art could not make or use the claimed invention without the need for undue
5 experimentation.

6 In response, MEMC argues that, due to the teachings of the '302 Patent, it would be well within
7 the knowledge and ability of one skilled in the art in 1998 to modify a then-existing crystal puller with
8 the commonly found insulators, heaters, radiation shields and magnetic fields of that time period to
9 extend and control the time during which a pulled silicon ingot cooled from the solidification
10 temperature down to 1050°C. MEMC further argues that enablement is "proven" by the very "fact" that
11 the inventors of the '302 Patent reduced the patent to practice in 1997 by making "just such
12 modifications."

13 As an initial matter, the Court notes that MEMC's argument is based solely on the declarations
14 submitted by Mule'Stagno, an employee of MEMC, and the named inventors of the '302 Patent, Falster
15 and Holzer. In order to establish an actual reduction to practice, an inventor's testimony must be
16 corroborated by independent evidence. *See Cooper v. Goldfarb*, 154 F.3d 1321, 1130 (Fed. Cir. 1998).
17 Here, MEMC has not produced any such corroborating evidence. Even if the Court were to consider
18 Mule'Stagno's Third Declaration to be such corroborating testimony, which it is not under the applicable
19 standard because he is an interested party, the foundation that has been provided as the basis for
20 Mule'Stagno's testimony is questionable. For example, Mule'Stagno merely states that he has "personal
21 knowledge that the inventors of the '302 Patent produced silicon wafers having a large region of vacancy
22 dominated agglomerated vacancy defect-free silicon surrounded by a region of interstitial dominated
23 agglomerated interstitial defect-free silicon prior to September 5th, 1997." *See Mathiowetz Decl. ISO*
24 *Opp. to Mot. re Non-Infring.* at Ex. 16 (Third Mule'Stagno Decl. at ¶ 2). However, Mule'Stagno does
25 not provide any further explanation with regard to the basis of his personal knowledge, such as whether
26 he directly participated in the manufacturing process or whether his knowledge of the process employed
27 by the inventors is merely based on their communications to him after the fact.

28 Further, even assuming, *arguendo*, that the Declarations of Falster and Holzer, and the Third

1 Declaration of Mule'Stagno, are admissible evidence that MEMC reduced the '302 Patent to practice
2 in 1997, the Declarations do not create a genuine issue of fact precluding summary judgment in
3 SUMCO's favor. The critical issue here is whether the '302 is sufficiently enabling *without the need for*
4 *undue experimentation*. In determining whether a disclosure would require undue experimentation, the
5 Court may consider, *inter alia*, the (1) the quantity of experimentation necessary; (2) the amount of
6 direction or guidance present; (3) the predictability or unpredictability of the art; and (4) the breadth of
7 the claims. *In re Wands*, 858 F.2d at 731. Here, the breadth of the claims is quite expansive, and Falster
8 and Holzer's testimony does not show that they did not engage in undue experimentation to reduce the
9 patent to practice. Instead, their testimony supports SUMCO's assertion that the necessary direction and
10 guidance is, in fact, missing from the '302 Patent. For example, absent from Holzer's Declaration is any
11 reference to where, in the '302 Patent, the necessary hot zone design is disclosed. *See* Mathiowetz Decl.
12 ISO Opp. to Mot. re Non-Infring. at Ex. 14. Further, Holzer admits that, in order to produce vacancy
13 and interstitial dominated agglomerate free silicon, he and the other named inventors had to perform
14 certain unspecified modifications to "ordinary hot zones." *Id.* at Ex. 14 (Holzer Decl. at ¶ 15).

15 Falster's Declaration also compels the conclusion that the guidance set forth in the '302 Patent
16 is sorely lacking. For instance, in Falster's Declaration he states:

17 The equipment used to extend the cooling time of silicon crystals was well
18 known in the art prior to the '302 patent and is described in the patent. For
example, the '302 patent states:

19 Control of the cooling rate can be achieved by using *any*
20 *means* currently known in the art for minimizing heat
transfer, including the use of insulators, heaters, radiation
21 shields, and magnetic fields. Column 9, lines 46-49.

22 *Id.* at Ex. 15 (Falster Decl. at ¶ 10) (emphasis added). Falster does not identify any other provision in
23 the '302 Patent that describes or discloses the means used to achieve the required control of the cooling
24 rate.

25 Indeed, the only description of the actual hot zone purportedly used by the inventors is set forth
26 in the Third Declaration of Mule'Stagno. However, in his Declaration, Mule'Stagno merely states that
27 the inventors used a SAC-1 hot zone and then "modified" it by inserting a heat shield to slow the rate
28 at which the ingot cooled. *Id.* at Ex. 16 (Third Mule'Stagno Decl. at ¶ 3). Mule'Stagno also vaguely

1 asserts that the heat shield was made from a conventional crucible "by cutting a hole through the bottom
2 of it." *Id.* No other explanation regarding the hot zone design is provided. As such, the Third
3 Declaration of Mule'Stagno makes clear that the hot zone design purportedly used by the inventors is
4 not disclosed in the '302 Patent.

5 Since it is undisputed that the necessary hot zone design is not disclosed in the '302 Patent and
6 it is also undisputed that a specific hot zone design coupled with modeling and simulation work is
7 essential to producing defect-free zones in silicon wafers, the Court concludes that SUMCO has proven,
8 by clear and convincing evidence, that the '302 Patent is invalid for lack of enablement. Accordingly,
9 the Court hereby GRANTS SUMCO's Motion for Summary Judgment of Non-Infringement and
10 Invalidity on this basis. MEMC's Motion for Summary Judgment Against Defendants' Invalidity
11 Affirmative Defense is therefore DENIED IN PART.

12 **B. Anticipation**

13 Since the Court concludes that the '302 Patent is not infringed by the accused wafers and is
14 invalid for lack of enablement, the Court need not reach SUMCO's alternative argument that the '302
15 Patent is also invalid as anticipated by certain prior art. Nevertheless, these issues have been fully
16 briefed in exhaustive detail by the parties, and therefore, in the interests of completeness and efficiency,
17 the Court's analysis of SUMCO's anticipation defense is set forth below.

18 **1. Claim Charts**

19 As a preliminary matter, with respect to SUMCO's affirmative defense of anticipation, MEMC
20 argues that SUMCO should be precluded from relying on this theory because SUMCO's claim charts
21 for the prior art references fail to satisfy Patent Local Rule 3-3(c). In particular, MEMC takes issue with
22 the charts for References 1, 3-4, and 6-14.¹⁴ In response, SUMCO argues that MEMC's objections to
23 SUMCO's claim charts are without merit and are untimely.

24 The Court agrees with SUMCO and therefore declines to preclude SUMCO from relying on the
25 prior art references identified in its Revised Final Invalidity Contentions. On November 13, 2003, in
26 response to MEMC's Motion to Strike Defendants' Preliminary and Final Invalidity Contentions, the
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28 ¹⁴MEMC concedes that the claim charts for Reference 2 and 5 are sufficient.

1 Court found that SUMCO's claim charts violated the specificity requirements of Patent Local Rule 3-
2 3(c). However, SUMCO was granted leave to file revised invalidity contentions containing new claim
3 charts. As directed by the Court, SUMCO revised its claim charts and served its Revised Final
4 Invalidity Contentions on January 12, 2004. Both MEMC and SUMCO subsequently filed
5 cross-motions for summary judgment. MEMC did not criticize SUMCO's claim charts in either its own
6 motion for summary judgment or in its response to SUMCO's motion for summary judgment.
7 Additionally, and more significantly, when the case was remanded to this Court for further proceedings,
8 the Court held a Case Management Conference on September 22, 2005, and thoroughly discussed all
9 of the relevant case scheduling issues with the parties. Despite this fact, and the fact that a significant
10 amount of time had elapsed since the date that MEMC was served with SUMCO's Revised Final
11 Invalidity Contentions, MEMC did not notify SUMCO, or the Court, that it intended to object to
12 SUMCO's Revised Final Invalidity Contentions pursuant to Patent Local Rule 3-3(c) until it filed the
13 instant Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense on
14 *December 6, 2005*. MEMC's current objections to the Revised Final Invalidity Contentions are
15 therefore decidedly untimely.

16 Further, MEMC's objections to SUMCO's claim charts are unpersuasive. The Court finds that
17 SUMCO's claim charts provide MEMC with sufficient notice as to how SUMCO contends that each
18 element of each asserted claim is found in the particular prior art reference. Specifically, the charts
19 contain written comparisons, as well as references to testimony by expert witnesses who purportedly
20 compared each element of each asserted claim with the specific items of prior art. *See Mathiowetz Decl.*
21 *ISO Mot. re Invalid. at Ex. 4 (Revised FICs)*. For example, the claim chart for Reference No. 1 refers
22 to the attached Submission of Publications which provides a comprehensive comparison of each element
23 of each asserted claim. *Id.* Similarly, with respect to Reference No. 3, the claim chart incorporates a
24 description of the reference on pages 19-20 from the attached Submission of Publications. *Id.*
25 Regarding Reference No. 4, the claim chart includes a supplementary explanation that specifically
26 incorporates testimony by Park, Eidenzon, Wildes, and King. *Id.* Similarly, the claim charts for
27 Reference Nos. 6-14 incorporate the testimony of Eidenzon and Puzanov and cite to specific paragraphs
28

1 in Eidenzon's expert report.¹⁵ *Id.* Accordingly, MEMC's objections to the Revised Final Invalidity
 2 Contentions are without merit. The Court will therefore proceed to the next step of the analysis, which
 3 is a determination of whether any of the prior art references anticipate the '302 Patent, thereby rendering
 4 it invalid.

5 **2. Anticipation by Prior Art References**

6 Under 35 U.S.C. § 102, a person shall be entitled to a patent unless:

7 (a) the invention was known or used by others in this country, or patented or
 8 described in a printed publication in this or a foreign country, before the
 invention thereof by the applicant for patent, or

9 (b) the invention was patented or described in a printed publication in this or
 10 a foreign country or in public use or on sale in this country, more than one year
 prior to the date of the application for patent in the United States, or

11 (c) the invention was described in (1) an application for patent, published under
 12 section 122(b), by another filed in the United States before the invention by the
 applicant for patent or (2) a patent granted on an application for patent by
 13 another filed in the United States before the invention by the applicant for
 patent, except that an international application filed under the treaty defined in
 14 section 351(a) shall have the effects for the purposes of this subsection of an
 application filed in the United States only if the international application
 15 designated the United States and was published under Article 21(2) of such
 treaty in the English language; or

16 (f) he did not himself invent the subject matter sought to be patented, or

17 (g)(1) during the course of an interference conducted under section 135 or
 18 section 291, another inventor involved therein establishes, to the extent
 permitted in section 104, that before such person's invention thereof the
 19 invention was made by such other inventor and not abandoned, suppressed, or
 concealed, or (2) before such person's invention thereof, the invention was
 20 made in this country by another inventor who had not abandoned, suppressed,
 or concealed it. In determining priority of invention under this subsection, there
 21 shall be considered not only the respective dates of conception and reduction
 to practice of the invention, but also the reasonable diligence of one who was
 22 first to conceive and last to reduce to practice, from a time prior to conception
 by the other.

23 35 U.S.C. § 102.

24 In its Motion for Summary Judgment of Non-Infringement and Invalidity, SUMCO asserts that
 25 there are four relevant prior art publications that invalidate the '302 Patent under 35 U.S.C. § 102(a) and
 26 (b): (1) Reference No. 2, which is a publication entitled "Growth Parameters Determining the Type of
 27

28 ¹⁵The depositions of Eidenzon and Puzanov were taken in the fall of 2002, well before
 MEMC received the Revised Final Invalidity Contentions.

1 Grown-In Defects in Czochralski Silicon Crystals;" (2) Reference No. 5, which is a publication entitled
 2 "Classification of Grown-In Microdefects in Czochralski-Grown Silicon Crystals;" (3) Reference No.
 3 6, which is Dr. Puzanov's 1987 Thesis Defense; and (4) Reference No. 7, which is a publication entitled
 4 "Defect-free Silicon Crystals Grown by the Czochralski Technique."¹⁶

5 With respect to anticipation under 35 U.S.C. § 103(e), (f), and (g), there is only one relevant
 6 prior art reference that SUMCO contends invalidates the '302 Patent. This reference is Reference No.
 7 4, which is U.S. Patent No. 6,045,610 (the "'610 Patent").

8 Although considered a question of fact, anticipation is appropriate for summary judgment if no
 9 genuine issue of material fact exists. *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316,
 10 1327 (Fed. Cir. 2001) (affirming summary judgment of invalidity where "no reasonable jury could find"
 11 the patent valid in light of the prior art). In order for SUMCO's § 102 affirmative defense to be
 12 successful, "each and every" element of the asserted claims must be found in a single prior art reference
 13 by clear and convincing evidence. *Union Oil Co. of Cal. v. Atlantic Richfield Co.*, 208 F.3d 989, 994-95
 14 (Fed. Cir. 2000). If there is even one claim element missing in a reference asserted by SUMCO, its
 15 invalidity defense under § 102 as to that reference must fail. "The law imposes this high burden because
 16 [the '302 Patent], like any issued patent, enjoys a presumption of validity." *Id.* at 995.

17 **a. Prior Art References that Have Been Abandoned by SUMCO**

18 In its Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense,
 19 MEMC argues that SUMCO has not established, by clear and convincing evidence, that any of the
 20 fourteen prior art references anticipate the '302 Patent. SUMCO's Opposition fails to respond to certain
 21 arguments asserted by MEMC and thus it appears that SUMCO has abandoned its reliance on certain
 22 prior art references. Because SUMCO's concessions narrow the disputed issues before the Court,
 23 MEMC's arguments regarding these prior art references will be discussed first.

25
 26 ¹⁶In its Motion for Summary Judgment of Non-Infringement and Invalidity, SUMCO also
 27 contends that the asserted claims of the '302 Patent are anticipated by an article published by
 28 Voronkov in 1996 (the "Voronkov article"). As MEMC points out, SUMCO's Final Revised
 Invalidity Contentions do not include the Voronkov article. As such, SUMCO is precluded from
 relying on this reference in support of its invalidity contentions and SUMCO's arguments pertaining
 to this reference have been disregarded.

1. Reference No. 1: Unexamined Patent Application No. Hei 8-330316

Reference No. 1 is Unexamined Patent Application No. Hei 8-330316. *See* Mathiowetz Decl. ISO Mot. re Invalid. at Ex. 4 (Revised FICs at 9). SUMCO contends that this reference was published on December 13, 1996. *Id.*

As noted above, SUMCO does not rely on Reference No. 1 in support of its Motion for Summary Judgment of Non-Infringement and Invalidity. However, since MEMC has moved separately for summary judgment that Reference No. 1 does not render the '302 Patent invalid, the Court must make a determination with regard to this prior art reference.

MEMC argues that Reference No. 1 does not render the '302 Patent invalid because it fails to disclose a vacancy dominated, agglomerate-free region. Further, MEMC asserts that SUMCO's expert has admitted that Reference No. 1 does not provide enough information for him to conclude that this region was vacancy dominated as required by the asserted claims. SUMCO utterly fails to respond to any of MEMC's arguments, even though it is SUMCO's burden to produce evidence in support of its own affirmative defense. Thus, the Court hereby determines that Reference No. 1 does not anticipate the '302 Patent as a matter of law.

2. Reference No. 3: Park's Article "Effect of Crystal Defects on Device Characteristics"

Reference No. 3 is an article by Park entitled "Effect of Crystal Defects on Device Characteristics," which was published at the Proceeding of 2nd International Symposium on Advanced Science and Technology of Silicon Material on November 25 through 29, 1996.

Like Reference No. 1, SUMCO has not relied on Reference No. 3 in support of its Motion for Summary Judgment of Non-Infringement and Invalidity. However, since MEMC has moved separately for summary adjudication that Reference No. 3 does not render the '302 Patent invalid, the Court must consider MEMC's arguments. In support of its Motion, MEMC argues that Reference No. 3 fails to disclose a vacancy dominated, agglomerate-free region. MEMC also argues that Figure 15 in Reference No. 3 is simply a schematic diagram depicting the initial concentration and type of point defects as a function of the ratio v/G . Thus, Figure 15 does not disclose every limitation of the asserted claims of the '302 Patent, as SUMCO contends. Again, SUMCO fails to provide any argument in opposition to

MEMC's Motion. Accordingly, the Court finds, as a matter of law, that Reference No. 3 is not statutory prior art that anticipates the '302 Patent.

3. Reference No. 14: Russian Text Book Excerpt

Reference No. 14 is a 1988 Russian text book excerpt identified by SUMCO as "Defendants' deposition Exhibit 22-a textbook published in 1988." MEMC argues that Reference No. 14 fails to disclose a vacancy dominated, agglomerate-free region or a silicon wafer. Again, SUMCO fails to provide any response to MEMC's argument. Accordingly, the Court finds, as a matter of law, that Reference No. 14 is not statutory prior art that anticipates the '302 Patent.

b. Other 35 U.S.C. § 102(a) and (b) Prior Art References

As to the remaining 35 U.S.C. § 102(a) and (b) prior art references, SUMCO has either responded to MEMC's summary judgment motion, or has independently moved for summary judgment with regard to that prior art reference. Each reference is discussed below. However, as set forth in greater detail in the following discussion, with respect to these remaining prior art references, SUMCO has utterly failed to carry its burden of proof and has not shown either that: (1) it is entitled to judgment as a matter of law that the references anticipate each and every claim limitation of the '302 Patent, or (2) that there are genuine issues of fact precluding summary judgment in MEMC's favor.

1. Reference No. 2: The 1995 Hourai Article

Reference No. 2 is an article by M. Hourai and others entitled "Growth Parameters Determining the Type of Grown-In Defects in Czochralski Silicon Crystals." *See* Powers Decl. ISO Mot. re Non-Infring. at Ex. 31. According to SUMCO, the article was published in *Materials Science Forum*, Volumes 196 to 201, in 1995. SUMCO has moved for summary judgment in its favor that Reference No. 2 anticipates the '302 Patent. MEMC has also moved for summary judgment in its favor that Reference No. 2 does not anticipate the '302 Patent.

In particular, MEMC has set forth evidence in support of its argument that Reference No. 2 does not anticipate any of the asserted claims of the '302 Patent since it fails to disclose a vacancy dominated, agglomerate-free region. *See* Mathiowetz Decl. ISO Mot. re Invalid. at Ex. 13 (Second Falster Decl. at ¶ 31). As stated by Falster, Reference No. 2 identifies four regions (Regions I to IV) in the silicon being analyzed. *Id.* Region IV is the only region shown to have "defect free" silicon, and then only to

1 the extent of the open square boxes shown in Figure 5. *Id.* Since Region IV is dominated by interstitial
2 point defects, and not vacancy point defects as required by the asserted claims of the '302 Patent, Falster
3 contends that Region IV could never anticipate any of the asserted claims. *Id.* at Ex. 13 (Second Falster
4 Decl. at ¶ 32). Additionally, according to Falster, none of Regions I through III is described as being
5 "defect free." *Id.* Rather, on the last page of the exhibit, Regions I through III are described as being
6 "vacancy related defect regions." *Id.* Accordingly, nothing in this reference anticipates the vacancy
7 dominant silicon substantially free of agglomerated vacancy intrinsic point defects required by the
8 asserted claims. *Id.* at Ex. 13 (Second Falster Decl. at ¶ 33). MEMC also points out that the article fails
9 to indicate whether Region III was ever tested for defects. A failure to test the required regions in the
10 silicon is fatal to SUMCO's invalidity argument because it leaves open the question of whether the
11 silicon has less than about 1000 defects/cm³.

12 In response, SUMCO argues that Reference No. 2 "clearly shows two regions which are
13 vacancy-dominant with low agglomerates," namely, Region II and Region III. SUMCO then cites to
14 the following conclusory testimony from its expert, Eidenzon, which it contends "proves" that Reference
15 No. 2 meets each and every limitation of the asserted claims of the '302 Patent:

16 This publication demonstrates that agglomerate defect-free zones in large
17 diameter silicon crystals were well known before the '302 patent application
18 was filed. This publication investigates the growth rate and axial temperature
19 gradient, the V/G ratio, and the influence of this parameter on the distribution
20 of microdefects. The publication shows agglomerate defect-free zones along
the crystal axis (e.g., Region III, vacancy dominant agglomerate free). In my
opinion, [Reference No. 2] teaches the claim limitations from the asserted
claims of the '302 patent.

21 See Powers Decl. ISO Mot. re Non-Infring. at Ex. 7 (Eidenzon Decl. at ¶ 20). However, since this
22 testimony merely asserts, without any analysis, that the critical claim limitations are found in the prior
23 art, it is insufficient to preclude summary judgment in MEMC's favor. *Collins v. Northern Telecom*
24 *Ltd.*, 216 F.3d 1042, 1047 (Fed. Cir. 2000).

25 SUMCO also directs the Court's attention to the "Declaration of Dr. Jea-Gun Park, filed as
26 Exhibit D18 to SUMCO's Reply to Summons in the Opposition Division of the European Patent Office"
27 and the "Declaration of Dr. Anna Eidenzon, filed as Exhibit D17 to SUMCO's Reply to Summons in
28

the Opposition Division of the European Patent Office."¹⁷ See Powers Decl. ISO Opp. to Mot. re Invalid. at Exs. 33, 34. Having reviewed these documents, the Court concludes that these Declarations are also insufficient to meet SUMCO's burden of proof. First, as MEMC points out, the Declarations actually *undermine* SUMCO's position that Reference No. 2 "clearly" shows two regions "substantially free of agglomerated defects" since the issue of whether these Regions are free of defects is obviously a matter of considerable dispute in the European patent proceedings. Second, Eidenzon's Declaration makes clear that Eidenzon's opinion is with regard to whether Region III is a "vacancy type region that is substantially free of agglomerated point defects *as those words are defined by the '094 patent.*" See Powers Decl. ISO Opp. to Mot. re Invalid. at Ex. 34 at p. 16 (emphasis added). As such, Eidenzon's opinion is of no assistance to the Court in the instant proceedings. With respect to Reference No. 2, summary judgment in MEMC's favor is therefore GRANTED.

2. Reference No. 6: Nikolai Puzanov's 1987 Thesis Defense

Reference No. 6 is the "Thesis defense by Nikolai Puzanov at the Moscow Institute of Steel and Alloys in 1987." As an initial matter, MEMC is correct that SUMCO has offered no evidence that this thesis defense is a "printed publication" within the meaning of 35 U.S.C. § 102(a) and (b). Indeed, the only evidence that SUMCO has produced to the Court that pertains to Reference No. 6 is: (1) an unpublished review of the thesis, written by Professor M.G. Milvidskii; (2) the Declaration of Eidenzon; (3) three photographs of the inventors; and (4) SUMCO's own claim charts. See Powers Decl. ISO Mot. re Non-Infring. at Exs. 7, 23-24, 34A. While SUMCO contends that the unpublished review of Dr. Puzanov's dissertation proves that Puzanov's "[m]ain scientific results [were] published in scientific periodicals and presented at representative meetings and conferences," SUMCO has not provided any of these periodicals or publications to the Court. Without the alleged printed publication itself, the Court has no basis for finding that Reference No. 6 is prior art within the meaning of 35 U.S.C. § 102(a) or (b).

Further, even considering the evidence that SUMCO *has* submitted to the Court, it is apparent

¹⁷Additionally, SUMCO argues that patent claims "identical" to the ones asserted here were rejected by the Japanese Patent Office based on this prior art reference. However, SUMCO does not provide the Court with any support or evidence for this argument and therefore it has been disregarded.

1 that the evidence is utterly deficient to meet SUMCO's burden of proof. For example, although SUMCO
2 boldly states that "[t]he unrefuted evidence clearly and convincingly establishes that each of the claimed
3 elements from the asserted claims are found in the defect-free crystal that Dr. Eidenzon and Dr. Puzanov
4 made and published in 1986 and 1987, respectively," the portion of Eidenzon's testimony that SUMCO
5 relies on to support this assertion is as follows:

6 The agglomerate defect-free crystal we created in 1986 included 'a first axially
7 symmetric region in which vacancies are the predominant intrinsic point
8 defect.' The vacancy dominant region of the crystal was 'substantially free of
9 agglomerated vacancy intrinsic point defects.' The region also comprised 'the
10 central axis or has a width of at least about 15 mm.' Further, the crystal
11 contained a 'second axially symmetric region in which silicon self-interstitial
12 atoms are the predominant intrinsic point defect and which is substantially free
13 of agglomerated silicon sel-interstitial intrinsic point defects.' Each of the
14 claimed elements from the asserted claims of the '302 patent are found in the
15 defect-free crystal that Nikolai Puzanov and I made and published in 1986.

16 See Powers Decl. ISO Mot. re Non-Infring. at Ex. 7 (Eidenzon Decl. at ¶ 8).

17 Again, this type of unsupported¹⁸ and conclusory testimonial evidence does not create a genuine
18 issue of fact. It is commonly accepted that "a party may not avoid summary judgment simply by
19 offering an opinion of an expert that states, in effect, that the critical claim limitation is found in the
20 accused device." *Collins*, 216 F.3d at 1047. As such, the Eidenzon's testimony does not establish a
21 genuine issue of fact sufficient to defeat MEMC's summary judgment motion.

22 Critically, Eidenzon does not support her assertion that the claim limitations are met by the prior
23 art with any explanation as to *why* it meets those limitations or *how* Eidenzon knows that it meets those
24 limitations. *Collins*, 216 F.3d at 1046. Indeed, Eidenzon's only testimony with respect to *how* she
25 knows that the crystal was, in fact, free of agglomerated defects is her assertion that "she is familiar with
26 the detection limits that are described in the '302 patent" and "used the same *or similar methods* for
27 evaluating the 1986 crystal that [they] had created." Powers Decl. ISO Mot. re Non-Infring. at Ex. 7
28 (Eidenzon Decl. at ¶ 7) (emphasis added). In an apparent effort to further "clarify" which methods were

¹⁸To the extent that such corroborating evidence exists, SUMCO is responsible for identifying it in the instant motions. "It is not the trial judge's burden to search through lengthy technologic documents for possible evidence." *Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1353 (Fed. Cir. 2001). "The public interest in invalidating invalid patents does not override the well established procedure requiring the nonmovant to come forward with evidence sufficient to negate the movant's position." *Id.*

used, Eidenzon states that she and Puzanov "determined that the crystal [they] made was agglomerate defect-free by using copper decoration and infrared microscopy [and that] X-ray topography was also taken [and that] [o]ther samples were investigated by using gold diffusion and X-ray topography." *Id.* at Ex. 7 (Eidenzon Decl. at ¶ 6). In light of the fact that SUMCO has submitted literally hundreds of pages of briefing and evidence to this Court in which it has argued in painstaking detail that scientific testing relating to silicon ingots and wafers must be conducted according to precise and objectively verifiable methodology, the fact that SUMCO expects the Court to just *assume* that Eidenzon's testimony is reliable, scientific, and verifiable *evidence* that the prior art crystal was, in fact, free of agglomerated defects is simply stunning. It is also insufficient to carry SUMCO's burden of proof.

Further, MEMC has shown that Reference No. 6 fails to disclose a vacancy dominated, agglomerate-free region because Puzanov has admitted that the silicon ingot described in his thesis "demonstrated very high thermal stability" and an "absence of the centers of oxygen precipitation." *See* Mathiowetz Decl. ISO Mot. re Invalid. at 20 (Puzanov Depo. at 69:14-71:3). According to MEMC's expert, these admitted test results show that the ingot was interstitial dominated, not vacancy dominated as required by the asserted claims. *See id.* at Ex. 13 (Second Falster Decl. at ¶ 27). SUMCO does not offer any evidence to refute this. Thus, for all of the aforementioned reasons, the Court concludes that Reference No. 6 does not anticipate any of the asserted claims of the '302 Patent.

2. Reference Nos. 5, 7-8, and 11-13: The Eidenzon and Puzanov References

In both of the summary judgment motions pertaining to SUMCO's invalidity affirmative defense, the parties discuss Reference Nos. 5, and 7 through 13¹⁹ in conjunction and collectively refer to these

¹⁹Reference No. 5 is an article by Eidenzon and Puzanov entitled "Classification of Grown-In Microdefects in Czochralski-Grown Silicon Crystals." According to SUMCO, the article was received by *Inorganic Materials* on October 20, 1994 and was published in 1995. Reference No. 7 is an article by Eidenzon and Puzanov entitled "Defect-Free Silicon Crystals Grown by the Czochralski Technique," received by *Inorganic Materials* on February 16, 1996. Reference No. 8 is an article by Eidenzon and Puzanov entitled "The effect of thermal history during crystal growth on oxygen precipitation in Czochralski-grown silicon," published in *Semicond. Sci. Technol.* 7 in 1992. Reference No. 9 is an article by Eidenzon and Puzanov entitled "Formation of the bands of anomalous oxygen precipitation in Czochralski grown Si Crystals," published in *Journal of Crystal Growth* in 1994. Reference No. 10 is a 1986 Russian publication by Eidenzon and Puzanov.

1 prior art references as the "Eidenzon and Puzanov References." As such, except where expressly noted,
2 the following discussion will also refer to the Eidenzon and Puzanov References collectively.

3 SUMCO has moved for summary judgment that Reference Nos. 5 and 7 anticipate the '302
4 Patent as a matter of law. MEMC has opposed SUMCO's motion, and has filed its own summary
5 judgment motion in which it contends that all of the Eidenzon and Puzanov References are not prior art
6 as a matter of law.

7 SUMCO argues that each of the claimed elements from the asserted claims of the '302 Patent
8 are found in Reference No. 5. *See* Powers Decl. ISO Mot. re Non-Infring. at Ex. 7 (Eidenzon Decl. at
9 ¶¶ 15-17, 27-28), Ex. 29. Specifically, SUMCO notes that Figure 4 of Reference No. 5 shows several
10 vacancy and interstitial defect-free regions along the crystal axis. SUMCO further argues that all of
11 these figures contain agglomerate defect-free zones. Referring to Figure 5 of Reference No. 5, SUMCO
12 contends that the LTC area is, in fact, an area free of agglomerated vacancy defects. SUMCO also
13 argues that the denotation "B" refers to an interstitial type area that is free from agglomerated point
14 defects.

15 With respect to Reference No. 7, SUMCO also contends that each of the claimed elements from
16 the asserted claims of the '302 Patent are found in the prior art because Figure 3 of the prior art
17 publication "shows both vacancy-dominant and interstitial dominant regions," and the vacancy dominant
18 region "is more than 15 mm wide and substantially free of agglomerated point defects." *See* Powers
19 Decl. ISO Mot. re Non-Infring. at Ex. 7 (Eidenzon Decl. at ¶ 10), Ex. 27.

20 However, in general, with respect to all of these prior art references, MEMC explains that the
21 references pertain to Eidenzon and Puzanov's studies in the 1980's and 1990's, whereby Eidenzon and
22 Puzanov studied crystals that were grown under various experimental growth conditions such as ramped
23 pull rates, step change pull rates, halted crystals, co-doped crystals, and quenched crystals.

24
25 Reference No. 11 is an article by Puzanov entitled "Modeling point-defect distribution in
26 dislocation-free Si crystals grown from the melt," published in *Inorganic Materials* in 1996.
27 Reference No. 12 is an article by Eidenzon and Puzanov entitled "Selective interaction of twin
28 boundaries with vacancies and self-interstitials in dislocation-free Si tetracrystals," published in
Journal of Crystal Growth in 1997. Reference No. 13 is an article by Eidenzon and Puzanov
entitled "Harmful microdefects in the seed-end portion of large-diameter silicon ingots," published
in *Inorganic Materials* in 1997.

1 See Mathiowetz Decl. ISO Opp. to Mot. re Non-Infring. at Exs. 24-31. According to MEMC, the
2 publications show that Eidenzon and Puzanov identified defect regions containing five types of micro-
3 defects, A, A', D, alpha, and LTC. See *id.* at Ex. 24. Throughout all of the papers that Eidenzon and
4 Puzanov published, only one region was identified as being "defect free." *Id.* at Ex. 25. This region was
5 described as being "thermally stable," *i.e.*, it did not precipitate oxygen when subjected to oxygen heat
6 treatments. *Id.* Thus, even according to Eidenzon and Puzanov, none of the defect regions observed
7 by them was vacancy dominant. *Id.* at Ex. 25 at 222. Further, based on Eidenzon and Puzanov's
8 publications, one skilled in the art would only be able to conclude that all regions containing A, A', B,
9 alpha, and LTC microdefects are silicon crystal regions to be avoided when producing silicon for the
10 semiconductor industry.

11 MEMC further argues that SUMCO's expert, Wildes, has admitted that the Eidenzon and
12 Puzanov References do not disclose a *single crystal silicon wafer*. See Mathiowetz Decl. ISO Mot.
13 re Invalid. at Ex. 16 (Wildes Depo. at 201:25-202:16; 239:7-11; 254:11-16). SUMCO does not refute
14 this point. Thus, since all of the asserted claims require a single crystal silicon wafer, none of the
15 disputed claim limitations is found in the Eidenzon and Puzanov References and the References cannot
16 anticipate the '302 Patent as a matter of law.

17 Additionally, and quite significantly, as MEMC also points out, when SUMCO was defending
18 its own patent in the Japanese Patent Office, SUMCO was confronted with the Eidenzon and Puzanov
19 References and explicitly stated that the articles should be disregarded because they only describe
20 experiments with silicon and were not intended to show the production of ingots for making wafers.
21 For example, SUMCO stated:

22 The patentee does not deny that there are some descriptions in the cited
23 references 1 to 8 that teach or suggest that the defects-free region is formed at
24 a portion to the crystal-axis direction. However, all these techniques for
25 forming the defects-free region are conducted under irregular growth conditions
26 (with an operation change along the axis-direction such as the abrupt change
27 of a pulling-up speed and the stopping or quasi-stopping of the pulling-up)
28 which is not likely be [sic] adopted in the real growing process for
single-crystal silicon.

See Mathiowetz Decl. ISO Opp. to Mot. re Non-Infring. at Ex. 35. Such an admission by SUMCO
proves that the Eidenzon and Puzanov References fail to teach a person skilled in the art how to make

1 a silicon wafer of any defect profile, much less a wafer having a vacancy-dominated region substantially
2 free of agglomerated vacancy intrinsic point defects as required by each of the asserted claims. Again,
3 SUMCO does not even attempt to refute this point in any of the papers that it has filed with the Court.

4 Accordingly, based on the undisputed evidence, the Court finds that MEMC is entitled to
5 summary judgment in its favor that Reference Nos. 5 and 7 through 13 do not anticipate the '302 Patent.

6 **c. Anticipation Under 35 U.S.C. § 102(e), (f), and (g)**

7 **1. The '610 Patent**

8 The prior art reference that is at the heart of the parties' dispute with regard to anticipation under
9 35 U.S.C. § 102(e), (f), and (g) is Reference No. 4, which is the '610 Patent. By asserting the '610 Patent
10 as prior art, SUMCO bears "the burden of persuasion by clear and convincing evidence on all [of the]
11 issues relating to the status of the ['610 Patent] as prior art." *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572,
12 1576 (Fed. Cir. 1996).

13 **a. 35 U.S.C. § 102(e)**

14 Under 35 U.S.C. § 102(e), a patent is invalid if there is another issued patent published before
15 the priority date of the first patent that discloses the same invention. 35 U.S.C. § 102(e). A patent's
16 effective date as a prior art reference is the date on which it was filed in the United States. *See id.* The
17 '610 Patent was filed in the United States on December 12, 1997 and therefore preceded the '302 Patent,
18 which was filed on September 8, 1998. MEMC, however, contends that it is entitled to an earlier
19 priority date – *i.e.* September 12, 1997 – because September 12, 1997 was the date that the inventors
20 of the '302 Patent purportedly reduced the patent to practice. Although the Court concludes that MEMC
21 is not entitled to either a September 12, 1997 priority date *or* a September 8, 1998 priority date due to
22 the fact that the '302 Patent is non-enabling,²⁰ and due to the insufficiency of MEMC's evidence
23 pertaining to the September 12, 1997 reduction to practice, all of the parties' arguments regarding the
24 '610 Patent are set forth below.

25 First, in order to ascertain whether the '610 Patent anticipates the '302 Patent under 35 U.S.C.

26 _____
27 ²⁰Pursuant to 35 U.S.C. § 112, for a patent application to constitute a constructive reduction
28 to practice, it must enable one of ordinary skill in the art to make and use the invention, meet the
written description test, and set forth the best mode of invention. *See* 35 U.S.C. § 112; *see also*
Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1560 (Fed. Cir.1991).

§ 102(e), the Court must make two determinations: (1) whether the '302 Patent was actually reduced to practice²¹ prior to the filing date for the '610 Patent; and (2) whether the '610 Patent discloses the same invention. To prove an actual reduction to practice, MEMC needs to show that: (1) it constructed an embodiment that met all the limitations of the asserted patent claims; and (2) it determined that the invention would work for its intended purpose. *Taskett v. Dentlinger*, 344 F.3d 1337, 1340 (Fed. Cir. 2003); *see also Estee Lauder Inc. v. L'Oreal, SA*, 129 F.3d 588, 592 (Fed. Cir. 1997) (holding that, to prove actual reduction to practice, "an inventor must establish that he 'actually prepared the composition and knew it would work.'"). MEMC asserts that it created silicon wafers having all the elements of 1-6 and 11 in August 1997 and tested these wafers and appreciated their novel characteristics no later than September 12, 1997.

To show that MEMC constructed an embodiment of the '302 Patent that met all of the limitations of the asserted claims, MEMC relies on the following evidence: (1) testimony from the two inventors, Falter and Holzer; (2) testimony from Mule'Stagno; and (3) certain contemporaneous data.²²

As noted previously in the discussion pertaining to enablement, evidence of inventive facts must not rest alone on the testimony of the inventor himself. *Cooper v. Goldfarb*, 154 F.3d 1321, 1330 (Fed. Cir. 1998); *Chen v. Bouchard*, 347 F.3d 1299 (Fed. Cir. 2003). Thus, where a party seeks to show conception through the testimony of an inventor, it must produce independent evidence corroborating that testimony. *Price*, 988 F.2d at 1195. Such evidence is to be evaluated under a "rule of reason." *Id.* The "rule of reason" addresses the concern that a party claiming inventorship might be tempted to describe his actions in an unjustifiably self-serving manner in order to obtain a patent or to maintain an existing patent. *Id.* Thus, according to the applicable standard, since Falster, Holzer, and Mule'Stagno

²¹In evaluating priority, the Court may consider both the date of "conception" and the date of "reduction to practice." *Burroughs Wellcome Co. v. Barr Labs. Inc.*, 40 F.3d 1223 (Fed. Cir. 1994). Actual reduction to practice is the physical construction of an apparatus that works for the intended purpose or the actual carrying out of the steps of a process invention. *Scott v. Finney*, 34 F.3d 1058, 1063 (Fed. Cir. 1994). Conception and reduction to practice are questions of law, based on findings of fact. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986). To establish priority of an invention, a party must show either an earlier reduction to practice, or an earlier conception followed by a diligent reduction to practice. *Price v. Symsek*, 988 F.2d 1187, 1190 (Fed. Cir. 1993).

²²This data is found at Exhibit 39 to the Powers II Declaration, filed in support of SUMCO's Motion for Summary Judgment of Non-Infringement and Invalidity.

1 are all interested parties, the Court cannot rely on Falster, Holzer, or Mule'Stagno's testimony that
2 Falster and Holzer reduced the '302 Patent to practice in September 12, 1997 unless such testimony is
3 corroborated.

4 The "corroborating" evidence that MEMC has produced, which is data pertaining to certain
5 ingots purportedly produced and tested in September 1997, however, does not show: (a) that wafers
6 having the characteristics of the asserted claims were produced in August 1997, or that claims 1 through
7 6 and 11 were reduced to practice; (b) that ingot 77GCD was produced according to the cooling method
8 described in the '302 Patent; (c) that the ingot had a vacancy-dominant and agglomerated vacancy
9 defect-free region; (d) that the inventors grew ingot 77GCI according to the cooling method described
10 in the '302 Patent using a standard hot zone; or (e) that Holzer or Falster realized that they had
11 successfully produced wafers having the characteristics of the asserted claims. Indeed, as SUMCO has
12 noted, MEMC's evidence tends to suggest that the ingots did not meet the asserted claim limitations,
13 since MEMC's evidence indicates that the ingots contained a vacancy-rich central region with
14 agglomerates. *See Powers Decl. II ISO Mot. re Non-Infring. at Ex. 39.* Further, since Mule'Stagno's
15 testing has been found to be inadmissible due to its unreliability, there is no competent evidence before
16 the Court indicating that the ingots were tested and found to possess the required characteristics.
17 Further, the corroborating evidence does not show that Falster or Holzer appreciated that the ingots met
18 the claim limitations of the '302 Patent. Under the applicable standard, there must be contemporaneous
19 recognition and appreciation of the limitations of the claimed invention, the invention cannot be the
20 mere result of fortuitous happenstance. *See Estee Lauder, Inc.*, 129 F.3d at 593; *See Mycogen Plant*
21 *Science v. Monsanto Co.*, 243 F.3d 1316, 1336 (Fed. Cir. 2001). Since the contemporaneous records
22 that MEMC has identified do not provide any clarity into this issue, the Court cannot conclude, as a
23 matter of law, that MEMC is entitled to the September 12, 1997 priority date.

24 In order to determine whether summary judgment can be granted in SUMCO's favor with respect
25 to SUMCO's 35 U.S.C. § 102(e) invalidity affirmative defense, however, the Court must also complete
26 the second step of the analysis, which is whether the '610 Patent discloses each and every asserted
27 element of the '302 Patent. On this issue, SUMCO bears the burden of proof by clear and convincing
28 evidence. Here, SUMCO's evidence is neither clear nor convincing. Indeed, the sum total of SUMCO's

evidence with regard to the relationship between the '610 Patent and the '302 Patent consists of: (1) certain inadmissible and irrelevant "admissions" purportedly made by MEMC during settlement negotiations pertaining to a separate trade secret dispute between the parties; (2) Park's self-serving testimony concerning his own invention; and (3) Eidenzon's and King's conclusory and unsupported "corroborating" testimony.

Specifically, SUMCO first relies on the fact that MEMC purportedly "admitted" that "the technology ('invention') covered by the Park application is the same as the technology ('invention') covered in MEMC's patent specification." *See* SUMCO Opp. to Mot. re Invalid. at 6:8-11. In support of this assertion, however, SUMCO cites to a letter drafted by MEMC's counsel that plainly states on its face: "pursuant to Rule 408 of the Federal Rules of Civil Procedure, this letter shall be inadmissible in any legal proceedings between the companies."²³ *See* Powers Decl. ISO Opp. to Mot. re Invalid. at Ex. 10. Further, even if the Court were to consider this letter as admissible evidence, which it is not, MEMC has convincingly shown that the letter pertains to other MEMC patents, and that the letter's author does not directly compare the '302 Patent to the '610 Patent. *See id.*

Moreover, SUMCO cannot merely rely on the fact that MEMC has accused certain wafers, which may or may not have been made according to the '610 Patent, of infringement in order to establish that the '610 Patent invalidates the '302 Patent. As stated by the Federal Circuit in *Tate Access Floors v. Interface Architectural Resources*, 279 F.3d 1357, 1367 (Fed. Cir. 2002):

[A]ccused infringers are not free to flout the requirement of proving invalidity by clear and convincing evidence by asserting a "practicing prior art" defense to literal infringement under the less stringent preponderance of the evidence standard . . . it is the presence of the prior art and its relationship to the claim language that matters for invalidity.

Id.

Further, with respect to SUMCO's expert testimony regarding the relationship between the '610 Patent and the '302 Patent, SUMCO's "evidence" falls considerably short of the mark. First, SUMCO relies on the testimony of the '610 Patent's inventor, Park. However, as the Federal Circuit has noted,

²³SUMCO also relies on a MEMC slide presentation that states "Park/SEC file perfect/pure silicon patent applications." *See id.* at Ex. 11. It is quite inconceivable to the Court how SUMCO can seriously contend that this statement "proves" that each and every asserted claim of the '302 Patent is met by the '602 Patent. As such, the Court finds this argument unpersuasive.

"[t]he law has long looked with disfavor upon invalidating patents on the basis of mere testimonial evidence absent other evidence that corroborates that testimony." *Finnegan Corp. v. Int'l Trade Comm'n*, 180 F.3d 1354, 1366 (Fed. Cir. 1999). This is due to the fact that it is widely recognized that uncorroborated testimony concerning invalidating activities is unsatisfactory due to "the forgetfulness of witnesses, their liability to mistakes, their proneness to recollect things as the party calling them would have them recollect them, aside from the temptation to actual perjury." *The Barbed-Wire Patent*, 143 U.S. 275, 284 (1892). Further, Park's Declaration does not provide any guidance as to whether the regions disclosed in the '610 Patent are "substantially free from agglomerated point defects," within the meaning of the '302 Patent – *i.e.* less than about 1,000 defects/cm³ – or whether the regions are axially symmetric, within the meaning of the '302 Patent.

As to the corroborating evidence, SUMCO cites to a statement in King's Declaration in which he refers to SUMCO's claim charts and states that "based upon the facts and my review of the evidence, it is my opinion that the asserted claims of the '302 Patent are invalid under 35 U.S.C. § 102(e), (f), or (g)." *See* Powers Decl. ISO Opp. to Mot. re Invalid. at Ex. 9 (King Decl. at ¶ 14). Again, mere assertions that the claim limitations have been met do not create a genuine issue of fact. SUMCO also cites to the Eidenzon Declaration, which is similarly conclusory. *See id.* at Ex. 13. Indeed, the Eidenzon Declaration and the King Declaration do not even discuss or analyze many of the disputed claim limitations, such axial symmetry.

Moreover, SUMCO fails to produce any evidence in response to MEMC's argument that the '610 Patent fails to disclose a vacancy dominated, agglomerate-free region or that the '610 Patent fails to teach a wafer where such first axially symmetric region comprises the central axis or has a width of at least about 15 mm. Indeed, as MEMC points out, Figures 11 and 12 of the '610 Patent fail to disclose the type of silicon, *i.e.* interstitial or vacancy dominated, that corresponds to the areas marked "P."

Accordingly, although the Court concludes that MEMC has not shown that Falster and/or Holzer reduced the '302 Patent to practice prior to the issuance of the '610 Patent, MEMC is nevertheless entitled to summary judgment in its favor because SUMCO has not shown, through clear and convincing evidence, that each and every asserted claim of the '302 Patent is disclosed in the '610 Patent.

b. 35 U.S.C. § 102(f)

1 Further, SUMCO has produced no evidence pertaining to its 35 U.S.C. § 102(f) affirmative
2 defense. Under § 102(f), a person is not entitled to a patent if "he did not himself invent the subject
3 matter sought to be patented." *See* 35 U.S.C. § 102(f). To prove derivation under § 102(f), the party
4 asserting invalidity must prove "both prior conception of the invention by another and communication
5 of that conception to the patentee by clear and convincing evidence." *Eaton Corp. v. Rockwell Int'l*
6 *Corp.*, 323 F.3d 1332, 1344 (Fed. Cir. 2003). "The communication must be sufficient to enable one of
7 ordinary skill in the art to make the patented invention." *Id.*

8 MEMC argues that SUMCO cannot meet this standard because it has no evidence of: (1) any
9 conception by Park of any one of the asserted claims, much less conception of all of the asserted claims;
10 (2) any communication of the conception of the asserted claims to an inventor of the '302 Patent; or (3)
11 any communication sufficient to enable one of ordinary skill in the art to make the invention covered
12 by the asserted claims. SUMCO does not provide any response to these arguments and does not provide
13 the Court with any evidence that establishes that Park communicated his conception of the asserted
14 claims to an inventor of the '302 Patent in a way that would have enabled one of ordinary skill in the art
15 to make an invention covered by the asserted claims. Accordingly, summary judgment is hereby
16 GRANTED in MEMC's favor with respect to SUMCO's 35 U.S.C. § 102(f) invalidity defense.

17 **c. 35 U.S.C. § 102(g)**

18 Under 35 U.S.C. § 102(g)(2), the validity of a patent can be challenged only by providing clear
19 and convincing evidence that "before such person's invention thereof, the invention was made in this
20 country by another inventor who had not abandoned, suppressed, or concealed it." 35 U.S.C. §
21 102(g)(2). An inventor can establish that he or she was the first to invent under Section 102(g) by
22 demonstrating either that he or she was the first to reduce the invention to practice or that he or she was
23 the first to conceive of the invention and then, prior to the other party's conception, exercised reasonable
24 diligence in reducing the invention to practice. *Griffin v. Bertina*, 285 F.3d 1029, 1032 (Fed. Cir. 2002);
25 *The Dow Chem. Co. v. Astro-Valcour, Inc.*, 267 F.3d 1334 (Fed. Cir. 2001); *Slip Track Sys., Inc. v.*
26 *Metal-Lite, Inc.*, 304 F.3d 1256 (Fed. Cir. 2002).

27 MEMC argues that SUMCO cannot meet this standard because it has no evidence that Park's
28 "prior invention" activities occurred in this country. To the contrary, it is quite clear from the parties'

1 submissions that Park conducted his inventive activities exclusively in Korea or Japan. As such,
2 summary judgment is hereby GRANTED in MEMC's favor with respect to SUMCO's 35 U.S.C. §
3 102(g) invalidity defense.

4 **C. Obviousness Under 35 U.S.C. § 103(a)**

5 In its Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense,
6 MEMC argues that SUMCO has not shown, and cannot show, that the '302 Patent is invalid as obvious
7 under 35 U.S.C. § 103(a).

8 Again, because the asserted claims of the '302 Patent are presumed valid, SUMCO must put forth
9 clear and convincing evidence in support of this invalidity defense. *McGinley v. Franklin Sports, Inc.*,
10 262 F.3d 1339, 1349 (Fed. Cir. 2001). Specifically, SUMCO must prove that the differences between
11 the invention of the asserted claims and the prior art "are such that the subject matter as a whole would
12 have been obvious at the time the invention was made to a person having ordinary skill in the art." 35
13 U.S.C. § 103 (a).

14 As MEMC points out, when opposing MEMC's prior motion to strike SUMCO's invalidity
15 contentions, SUMCO asserted that it was alleging that *each* prior art reference identified in its
16 Preliminary and Final Invalidity Contentions rendered the asserted claims obvious *independently*. See
17 November 13, 2003 Order at 4:12-20. As such, SUMCO must now come forth with clear and
18 convincing evidence showing a suggestion or motivation to modify the teachings of the prior art
19 reference in such a way so as to yield the claimed invention. *In re Werner Kotzab*, 217 F.3d 1365, 1370
20 (Fed. Cir. 2000). In its Opposition to MEMC's Motion for Summary Judgment Against Defendants'
21 Invalidity Affirmative Defense, SUMCO's sole response to MEMC's obviousness argument is that
22 "MEMC's allegations regarding 35 U.S.C. § 103 should be ignored in view of this Court's prior ruling."
23 Opp. at 5.²⁴ However, this Court's November 13, 2003 ruling merely addressed the sufficiency of
24 SUMCO's Preliminary and Final Invalidity Contentions under the Patent Local Rules. The Court did
25 not analyze the legal sufficiency of the affirmative defense or hold that SUMCO had met its burden of
26 proof with respect to obviousness. Accordingly, SUMCO is required to come forth with both argument

27
28 ²⁴The Court also notes that SUMCO has not relied on the affirmative defense of obviousness
in its own Motion for Summary Judgment of Non-Infringement and Invalidity.

1 and evidence in opposition to MEMC's Motion. *See T.W. Elec. Serv.*, 809 F.2d at 630 (nonmoving party
2 must present specific facts creating a genuine issue of material fact); *see also Collins*, 216 F.3d at 1046
3 (holding that, in moving for summary judgment on an issue as to which the non-moving party bears the
4 burden of proof, the moving party discharges its initial responsibility by stating the basis for its motion
5 and pointing out that the evidence in the record would be insufficient to avoid a directed verdict).
6 Without any such argument or evidence, the Court finds that SUMCO has utterly failed to demonstrate
7 the existence of genuine factual issues sufficient to preclude summary judgment on its obviousness
8 affirmative defense. *Anderson*, 477 U.S. at 250. Thus, summary judgment is hereby GRANTED in
9 favor of MEMC on SUMCO's affirmative defense of obviousness pursuant to 35 U.S.C. § 103(a).

10 **III. Active Inducement**

11 Finally, although the Court concludes that SUMCO is entitled to a summary judgment finding
12 in its favor on non-infringement and on invalidity due to lack of enablement, since the parties devoted
13 two separate motions for summary judgment to the issue of active inducement of infringement, the issue
14 merits some discussion.

15 At the outset, the Court notes that the Federal Circuit has already determined that MEMC has
16 established that a reasonable juror could conclude that SUMCO actively induced Samsung Austin's
17 infringement of the '302 Patent. In fact, the Federal Circuit stated:

18 [W]e conclude that there are genuine issues of material fact with respect to
19 whether SUMCO induced infringement of the '302 patent on the part of
20 Samsung Austin. First, SUMCO had knowledge of MEMC's patent as well as
21 knowledge of Samsung Austin's potentially infringing activities. In addition,
22 there is evidence that SUMCO provides substantial technical support to
23 Samsung Austin in the form of e-mail communications. As noted above in Part
24 II, the series of e-mails between SUMCO and the engineer at Samsung Austin
25 demonstrate that SUMCO works with Samsung Austin to coordinate shipment
26 dates and the quantity of wafers sent in each shipment and that SUMCO makes
27 adjustments in the manufacturing process in order to address problems
28 Samsung Austin encounters with the wafers. Second, there is evidence that
during November and December 2002, SUMCO sent a shipment of certain
wafers directly to Samsung Austin in order to address technical problems with
previously-supplied SUMCO wafers. Third, there is evidence that SUMCO
personnel made several on-site visits to Samsung Austin, during which
technical presentations on the SUMCO wafers were made. In addition, as noted
above, Dr. Coria testified that Samsung Austin will not enter into an agreement
to buy wafers from a wafer supplier unless the supplier will also provide
Samsung Austin with technical support for the wafers.

In light of the above evidence of record and viewing this evidence in the light

1 most favorable to MEMC, we are not prepared to hold that a reasonable jury
2 could not find intent to induce infringement.

3 *See MEMC Electronic Materials, Inc.*, 420 F.3d at 1378-79.

4 Considering this quite clear, and thorough, discussion of the relevant evidence pertaining to
5 MEMC's active inducement claim, and the Federal Circuit's explicit mandate that this Court conduct
6 further proceedings *consistent* with its conclusion that there exists a genuine issue of fact with respect
7 to active inducement of infringement, SUMCO's request that this Court nevertheless disregard the
8 Federal Circuit's opinion and grant summary judgment in its favor is very questionable advocacy indeed.
9 Moreover, the evidence SUMCO has identified in its summary judgment motion only makes it more
10 evident that this is a vigorously disputed, factual issue. For example, the parties have identified
11 conflicting facts and testimony pertaining to, *inter alia*: (1) whether SUMCO provides quality control
12 data regarding the accused wafers to SAS; (2) the extent of an SAS engineer's involvement in the
13 coordination of shipments of the accused wafers from SUMCO; (3) whether SUMCO provides customer
14 service support to SAS; (4) the circumstances surrounding the alleged technical support; (5) the extent
15 of SUMCO's employees' visits to SAS; and (6) SUMCO's alleged investigation of the "edge detection
16 problem."

17 Due to these numerous factual issues, which are material and remain in dispute, a summary
18 judgment disposition on active inducement would not be appropriate. However, since direct
19 infringement is a threshold issue, and since MEMC has not met its burden of proof on the issue of direct
20 infringement, the Court hereby DENIES MEMC's separately-filed Motion for Summary Judgment on
21 Active Inducement. Since this renders SUMCO's arguments regarding damages moot, the Court also
22 DENIES SUMCO's Motion for Summary Judgment of Zero Damages AS MOOT.

23 CONCLUSION

24 IT IS HEREBY ORDERED AS FOLLOWS:

- 25 1. MEMC's Motion for Summary Judgment Against SUMCO's Invalidity Affirmative
26 Defense [Docket No. 544] is GRANTED IN PART AND DENIED IN PART. Summary
27 judgment in MEMC's favor is DENIED with respect to SUMCO's affirmative defense
28 of enablement. Summary judgment in MEMC's favor is GRANTED on SUMCO's

affirmative defense of anticipation. Summary judgment in MEMC's favor is also GRANTED with respect to SUMCO's affirmative defense of obviousness.

2. SUMCO's Motion for Summary Judgment of Non-Infringement and Invalidity of U.S. Patent No. 5,919,302 [Docket No. 505] is GRANTED IN PART AND DENIED IN PART. Summary judgment is GRANTED and judgment shall be entered in SUMCO's favor that the '302 Patent is not infringed. Additionally, SUMCO is entitled to judgment in its favor that the '302 Patent is invalid for lack of enablement. Summary judgment in SUMCO's favor is DENIED with respect to SUMCO's affirmative defense of anticipation.
3. MEMC's Motion for Summary Judgment against Defendants for Active Inducement of Infringement under 35 U.S.C. § 271(b) [Docket No. 667] is DENIED.
4. SUMCO's Motion for Summary Judgment of Zero Damages Because of No Inducement under 35 U.S.C. § 271(b) [Docket No. 499] is DENIED AS MOOT.
5. SUMCO's Objections to Plaintiff's Evidence Submitted in Support of its Motion for Summary Judgment Against Defendants' Invalidity Affirmative Defense [Docket No. 577] are SUSTAINED IN PART AND OVERRULED IN PART.
6. SUMCO's Objections to Plaintiff's Evidence Submitted in Opposition to Defendants' Motion for Summary Judgment of Non-Infringement and Invalidity [Docket No. 572] are SUSTAINED IN PART AND OVERRULED IN PART.

IT IS SO ORDERED.

Dated: 2/24/06


SAUNDRA BROWN ARMSTRONG
United States District Judge